Volume XXII.
Number 6.

JUNE, 1902.

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TEXTILE WORLD,

and Industrial Record.

The
Textile World
Official Directory
OF THE
Textile Industries
OF THE
United States and Canada
FOR 1902
Will be ready about
June 20th.

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CLASSIFIED INDEX FOR BUYERS, - Page 1177

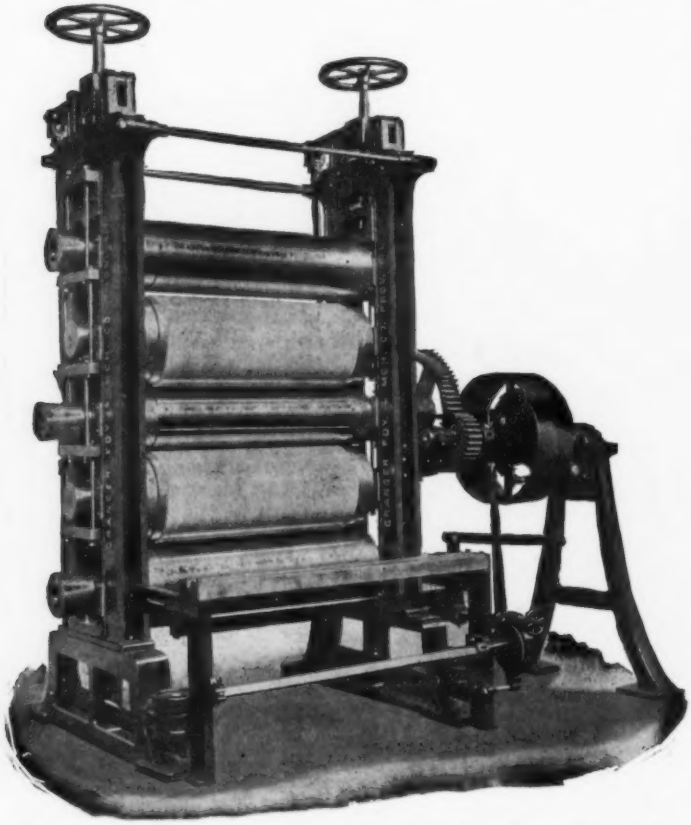
GUILD & LORD.
PUBLISHERS.

95 SOUTH STREET,
BOSTON, MASS.

COPYRIGHT, 1902, GUILD & LORD.

Bleaching, Dyeing, Drying,

And Finishing Machinery.



CALENDERS, MANGLES AND ROLLS.

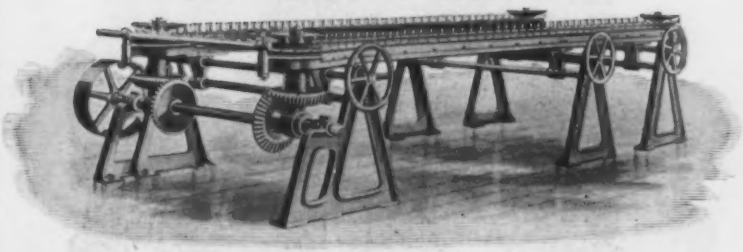
TENTERING MACHINES,
MERCERIZING MACHINES.

Granger Foundry and Machine Co.

PROVIDENCE, R. I.

Bleaching, Printing, Dyeing and Finishing Machinery

For Textile Fabrics.



STRAIGHT TENTERING MACHINE, WITH AUTOMATIC CLAMP. (Patented.)

TENTERING MACHINES.

VIBRATORY (or Swiss) MOTION FOR LAWNS, ETC.

RETURN (8, 10 or 12) returns FOR WORSTED AND WOOLEN GOODS.

HOT AIR (2 or 4 returns) FOR GINGHAMS, ETC.

AUTOMATIC CLAMPS (Patented). SPRING CLAMPS. PIN CHAINS.

H. W. BUTTERWORTH & SONS CO.,

PHILADELPHIA, PA.

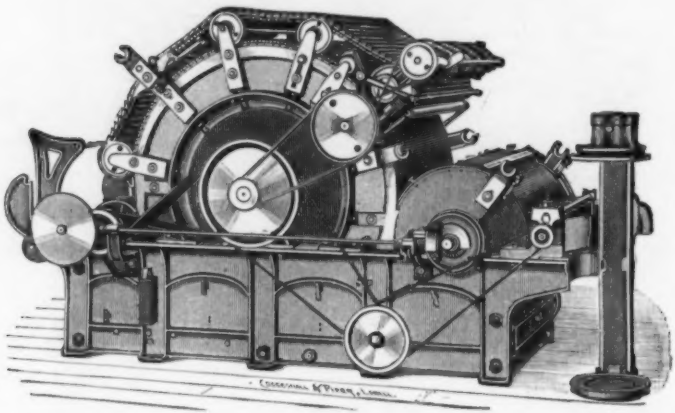
LOWELL MACHINE SHOP,

LOWELL, MASS.,

Builders of

COTTON MACHINERY

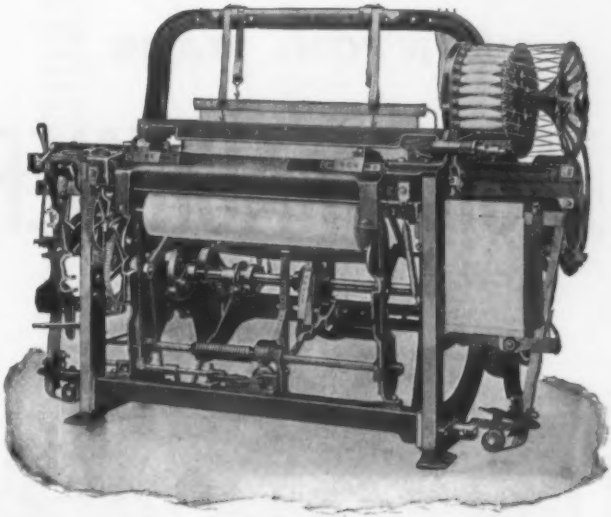
OF EVERY DESCRIPTION.



Revolving Flat Cards, Railway Heads,
Ring Spinning Frames, Fly Frames,
Drawing Frames, Spoolers, Warpers,
Slashers, Looms.

Worsted Machinery.

ILLUSTRATED CATALOGUES SENT ON APPLICATION.



OUR LATEST

NORTHROP LOOM

Although our order list lengthens and strengthens, we do not adopt the simple and inexpensive plan of building without change, but continually add improvements whenever possible. A careful study of the above illustration will prove of interest to adepts in the Art of Weaving.

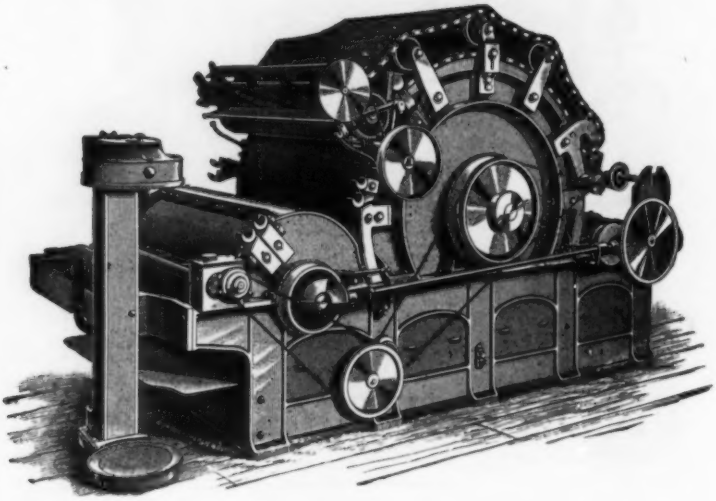
THE DRAPER COMPANY,

Hopedale, Mass.

MASON MACHINE WORKS,

TAUNTON, MASS.

COTTON MACHINERY

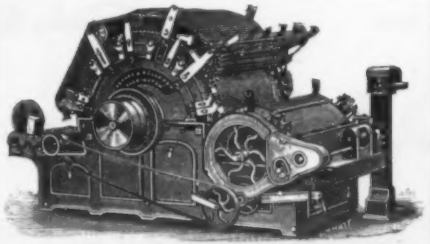


Cards, Combers, Lappers, Railway Heads, Drawing Frames, Spinning Frames, Mules and Looms,

INCLUDING

Plain and Fancy Silk Looms.

Southern Office, Charlotte, N. C.



HOWARD & BULLOUGH

American Machine Company,

LIMITED,

PAWTUCKET, - R. I.

Boston Office, 281 Congress St. Southern Offices, 814-815 Empire Bldg., Atlanta, Ga.

Revolving Flat Cards.

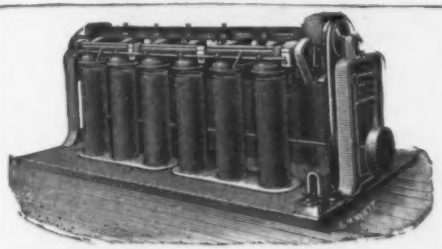
The Simplest and Most Accurate. Greatest Production. Best Quality. Least Waste.

OVER 16000 WORKING.

Electric Stop-Motion Drawing.

The quality of the sliver produced cannot be surpassed. Waste, "single" and roller laps are prevented, production increased, and great saving effected.

OVER 56,000 IN OPERATION.



Bale Breakers. Feeders,

Combined Self-Feeding Openers,

Breaker and Finisher Lappers,

All made from entirely new patterns and containing many valuable patented improvements.

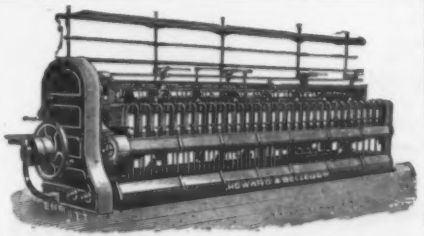
Slubbing, Intermediate, and Roving Machines.

New patented Differential motion, New Arrangement of Cone Drums, New System of Balancing top or bobbin rail, etc.

SPINNING FRAMES, CONE WINDERS,
TWISTERS, WARPERS AND SLASHERS.

All parts of above machines are made by special tools and are exact duplicates.

We invite Investigation and Comparison.



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Whitinsville, Mass.

COTTON MACHINERY

Revolving Flat Carding Engines.

Sliver Lap Machines.

Ribbon Lap Machines.

Combers.

Railway Heads.

Drawing Frames.

Spinning Frames.

Spoolers

Twisters.

Reels.

Long Chain Quilling Machines.

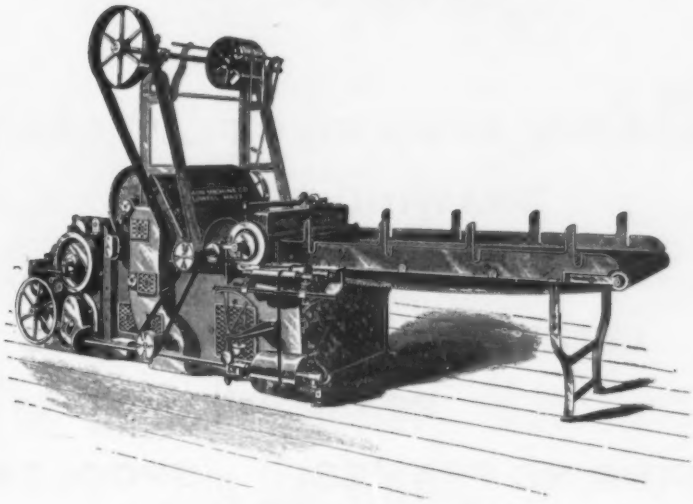
Looms.

SOUTHERN AGENT - S. W. CRAMER,

38 South Tryon Street, CHARLOTTE, N. C., and Equitable Building, ATLANTA, GA.

The Best Pickers.

In the Cotton Field nothing equals the
DARKY COTTON PICKER.



In the Cotton Mill nothing equals the
KITSON COTTON PICKERS.

KITSON MACHINE CO., Lowell, Mass.

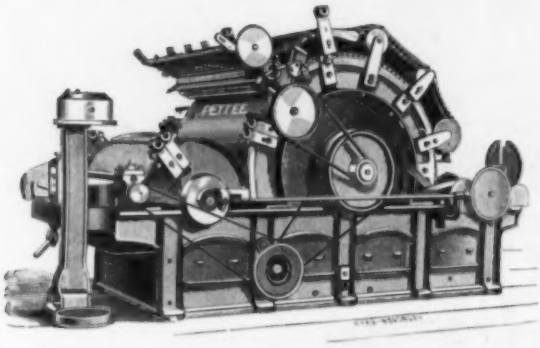
Largest Builders of Cotton Openers and Lappers in the World.

STUART W. CRAMER, Southern Agt., Charlotte, N. C. and Equitable Building, Atlanta, Ga.

Saco and Pettee Machine Shops,

Newton Upper Falls, Mass., U. S. A.

COTTON MACHINERY



PICKERS, REVOLVING FLAT CARDS,

DRAWING FRAMES,

RAILWAY HEADS, SLUBBING,

INTERMEDIATE AND ROVING

FRAMES,

SPINNING FRAMES, SPOOLERS.

SHOPS:

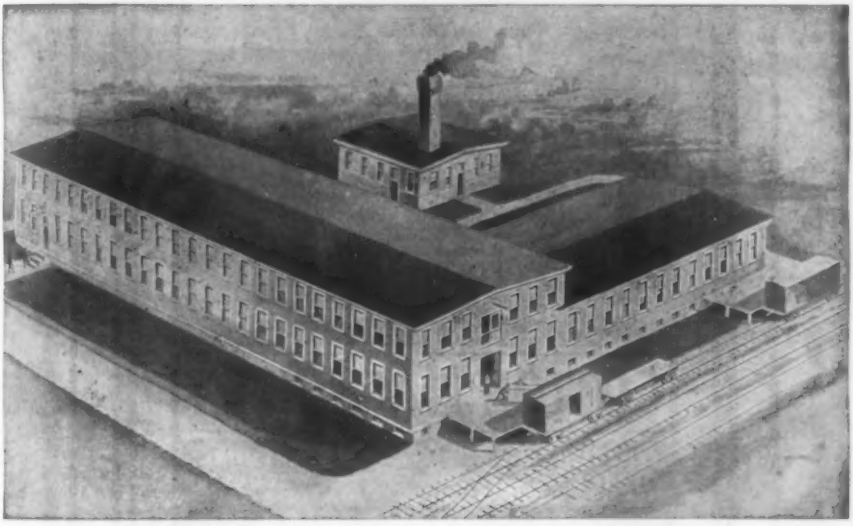
Biddeford, Maine.

Newton Upper Falls, Mass.

Southern Agent: A. H. WASHBURN, Charlotte, N. C.

Always Up-to-Date!

When we see a chance to improve our machinery we do it, even though we have to discard valuable patterns and special tools. We don't hold back because the old model was "good enough and superior to anything else." So with our works.



This new plant contains every facility for building

The Best Preparatory Machinery in the World.

It is manned by men trained to this special work and managed by men who know what manufacturers want and who strive to anticipate their needs.

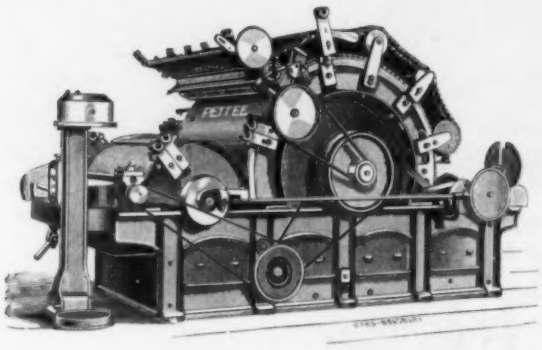
THE A. T. ATHERTON MACHINE CO.

PAWTUCKET, R. I.

Saco and Pettee Machine Shops,

Newton Upper Falls, Mass., U. S. A.

COTTON MACHINERY



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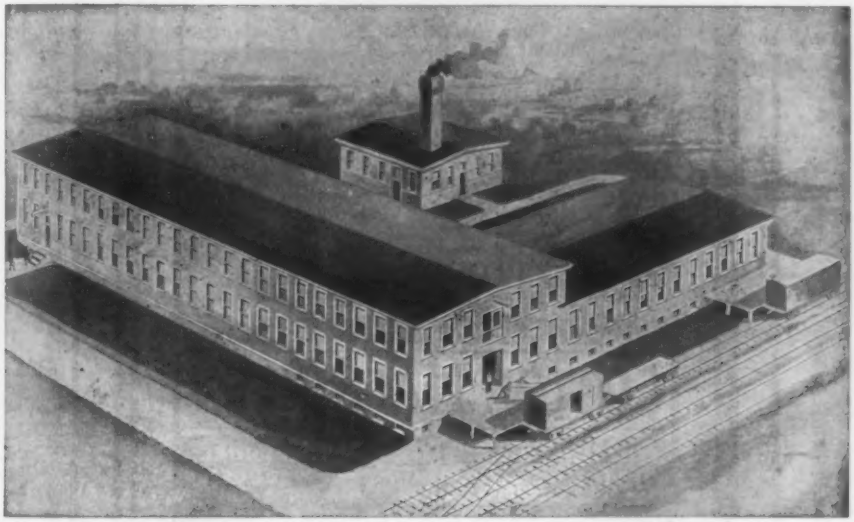

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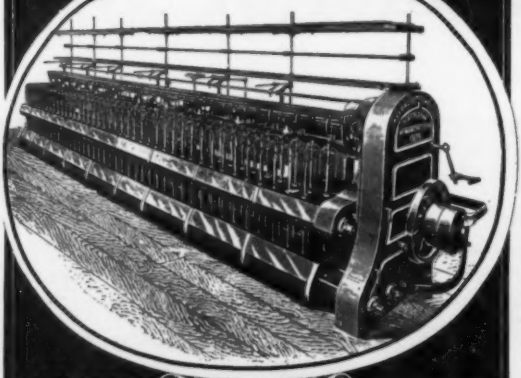
THE A. T. ATHERTON MACHINE CO.

PAWTUCKET, R. I.

H·G·McKERROW·

DRAWING FRAMES · SPEED FRAMES
· CARDS · · MULES ·



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CARD CLOTHING · WASTE MACHINERY

COTTON MACHINERY

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Card Room Machinery.
TAYLOR LANG & CO. LTD.
Self Acting Mules.
WILLIAM RYDER
Flyers.
C. CAIN, SON, & GREENWOOD,
Card Clothing of all Kinds.

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MILL SUPPLIES

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JOHN HETHERINGTON & SONS, LD.

Manchester, England.

BUILDERS OF ALL KINDS OF MACHINERY FOR

Preparing, Spinning, Doubling Cottons, Cotton Waste, Woolen, Etc.

THE NASMITH COTTON COMBER

Is the latest and best in the way of simplicity, larger product, better work;

MAY BE SEEN IN OPERATION AT MY OFFICE.

HETHERINGTON'S SELF ACTING MULE,

Over Three Million Spindles in the United States.

Sole Importer for United States and Canada,

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41-42 Brewer Building, 186 Devonshire Street.

J. S. COTHRAN, Charlotte, N. C., Southern Agent.

5000

Barber Knotters

Now in Use.

Barber & Colman,

11 Pemberton Sqnare,

BOSTON.

ROBT. C. WEBSTER, Manager.

Arguto Saddles Win.

The American agents for Prince Smith & Co., find them the most economical device for Worsted Spinning Frames.

IN awarding the contract to the Stoddard, Haserick, Richards & Co., for their new worsted spinning machinery (some 5008 spindles), the "Bradford Mills" stipulated that the same be equipped with ARGUTO OILLESS TENSION SADDLES. Messrs. John & James Dobson, having had three years' experience with these patent saddles, know their great advantages.

Mill owners who wish to save money and avoid accidents and breakdowns caused by lint gathering in the bearings and throwing off the bands, and by the heating of the pulleys, should specify, when ordering new spinning machinery or making repairs that they be equipped with ARGUTO OILLESS SADDLES. They relieve the superintendent's and proprietor's minds of all care and annoyance.

Seventy-eight per cent. of the Worsted Spinning Mills of this country are now using ARGUTO SADDLES on one frame or more. Can you afford to be without them?

Write for a sample if you want to save expense.

ARGUTO OILLESS BEARING CO.,

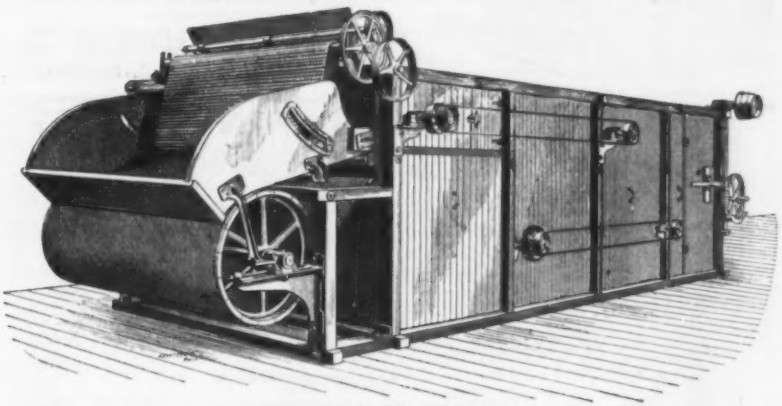
Wayne Junction, Philadelphia.

HF

"CYCLONE" DRYERS

For WOOL, COTTON STOCK, YARN,
UNDERWEAR, STOCKINGS. : :

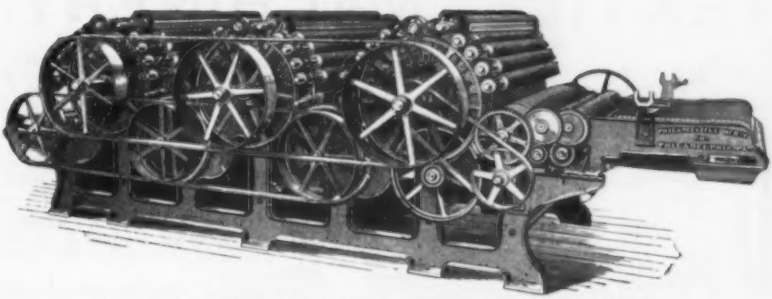
Carbonizing Machines. Yarn Scourers.



Automatic Stock Dryer.

GARNETT MACHINES,

BREASTS, BURRING MACHINES,
FEED ROLLS, LICKERS-IN. . . .



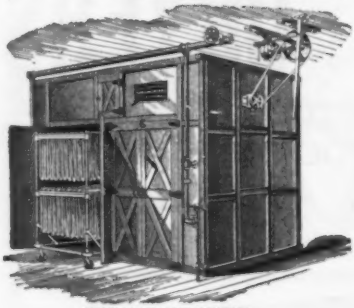
Proctor Improved Double Fancy Garnett Machine.

PHILADELPHIA TEXTILE MACHINERY CO.,

2750-60 Hancock St.,

PHILADELPHIA, - - - PA.

"HURRICANE" DRYERS



TRUCK YARN DRYER.

—FOR—

WOOL, COTTON STOCK, YARN, STOCKINGS, UNDERWEAR, &c.

CARBONIZERS,

Yarn Scouring Machines.

"HURRICANE" FANS

for Ventilating and Drying.

Best in Construction. Lowest in Price.

Plans, Estimates and Catalogues cheerfully furnished.

PHILA. DRYING MACHINERY CO.,

6721 GERMANTOWN AVE., PHILADELPHIA, PA.

A PERFECT PIN TICKET

For Cloth Samples and Garments.

Easily and quickly applied to fabrics of any weight.
Securely attached and yet easily detached if necessary to remove.
The machine does the whole thing.
It is cheap, serviceable and durable.

We also make a machine which

PRINTS the TICKETS as they are attached if desired.

Send for particulars to

SARANAC ELECTRICAL MFG CO.,

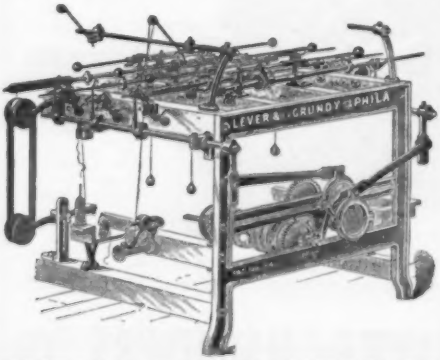
ST. JOSEPH, MICH.

OSWALD LEVER,

Formerly LEVER & CRUNDY

BUILDERS OF

TEXTILE MACHINERY.



FILLING COP WINDING MACHINES. Spindles driven by belts or by gears. To wind cops. Cops to weave from the inside, or butts to weave from the outside. Can be made to wind any kind of filling from the coarsest to fine numbers. These machines will put the most yarn in as given size of shuttle than any other machine in use.

BANDLESS SPINDLE SPOOLING MACHINES. Adapted to the finer grades of yarn and to the finest silk.

PRESSER DRUM SPOOLING MACHINES. Arranged to spool in any way the trade requires.

BANDLESS VARIABLE SPEED MACHINES. To wind the large bobbins used in knitting mills.

CONICAL and STRAIGHT TUBE WINDING MACHINES.

DRESSER SPOOLING MACHINES.

Beaming Machines, Sectional Warp Mills, Chenille Cutting Machines, Reeling Machines to prevent waste at the bottom of mule bobbins.

Lehigh Ave. & Mascher St., PHILADELPHIA, Pa.

NEW ENGLAND BUTT COMPANY,

304 Pearl St., Providence, R. I.

BRAIDING MACHINERY,

All Styles and Kinds for Flat and Round Braids.

SOLID SASH AND CURTAIN CORDS.

Shoe and Corset Laces, Banding and all

BRAIDED FABRICS.

FAIRMOUNT MACHINE CO

22ND & WOOD STS.
PHILADELPHIA.

THE LATEST AND BEST.

LOOMS, DOBBIES, HARNESS MOTIONS

BEAMING SPOOLING WINDING DYEING AND SIZING MACHINERY

POWER TRANSMITTING MACHINERY.
FREIGHT ELEVATORS, PATENT FRICTION CLUTCHES.

Our Portable Hoist

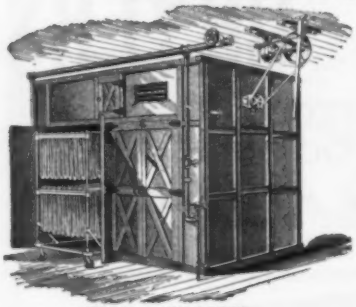
Is a Great
Labor Saver.

KNUCKLE JOINT PRESS. WITHOUT KNUCKLE JOINT.

It is designed especially for piling cases, bales and heavy packages, or elevating them through a door or opening. A man can lift 800 pounds with it. It is easily handled and while strong and substantial can be rolled around at will. Many mills are using them.

JOHN E. LARRABEE, Amsterdam N. Y.

"HURRICANE" DRYERS



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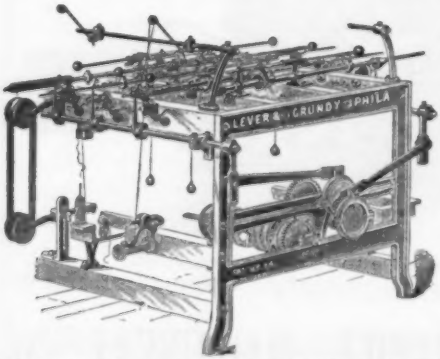

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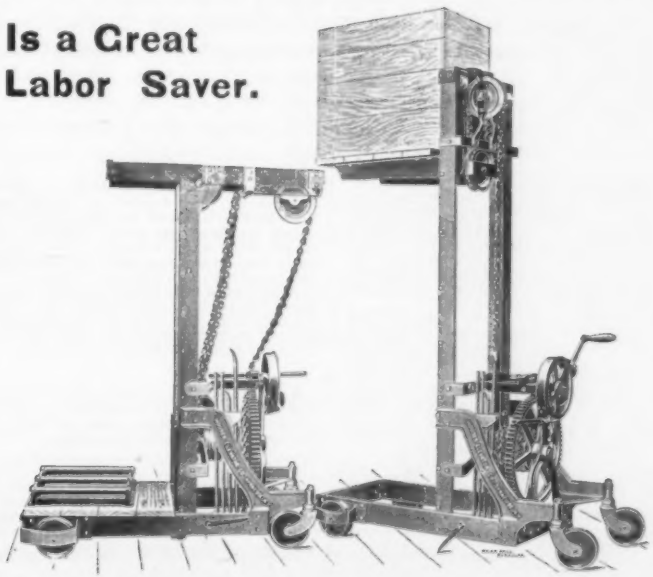

KNUCKLE JOINT PRESS. WITHOUT KNUCKLE JOINT.

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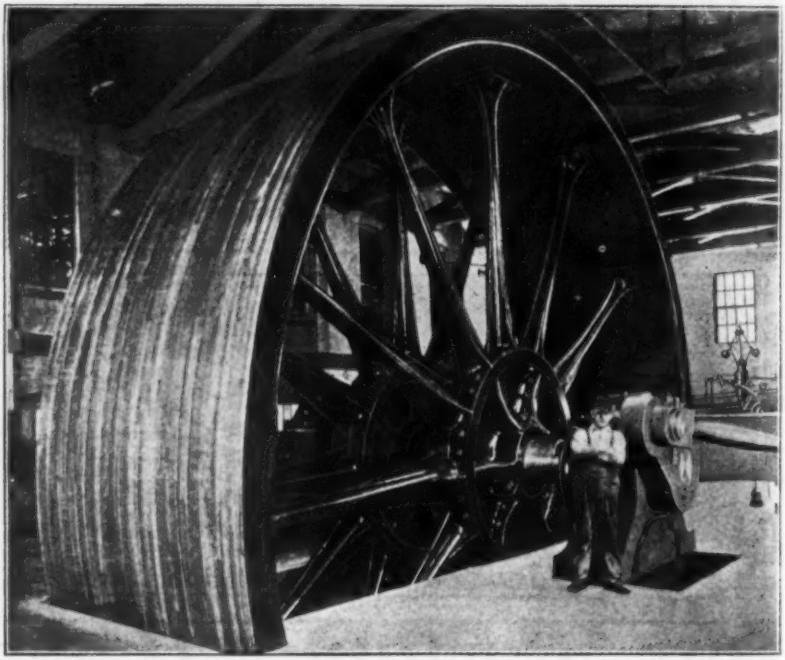
JOHN E. LARRABEE, Amsterdam N. Y.

The Amoskeag Fly-Wheel.



Announcement. It gives us pleasure to inform you that we have recently completed arrangements with the Amoskeag Manufacturing Company, of Manchester, N. H., in accordance with which we have taken over their wood-rim pulley department, including the fly-wheels as designed by Mr. Charles H. Manning, their Superintendent, and in this connection he has consented to act as our consulting engineer.

As to Construction.—In the construction of the fly-wheel shown in our illustration, width is 30 ft. diameter, the arms are so designed that each one will safely carry the belt-strain coming on its half of the wheel if the other eleven arms were entirely relieved, and the bolting of the hub is sufficient to carry its portion of the rim if cut adrift from the remainder of the rim.

The rim is built up in courses of thoroughly kiln-dried wood of from 3 to 4 inches in thickness. The butts in each course are left open ¾ of an inch at the outer ends, and well-fitting hard-wood wedges are driven in on hot glue, with a heavy sledge, as are also the hard-wood keys between the outer ends of the arms and the rim. Each piece in every course is thoroughly glued and secured in place with 3½-inch lag bolts.

As to Safety.—Compared with iron, the wood rim is ten times safer than the cast-iron *when* the castings are good. This allows the wood-rim pulley to increase its speed to 3.25 times that of a sound cast-iron one, with equal safety.

As to Weight.—A fact not generally known is, that nearly all large cast-iron wheels which serve as balance wheels on steam engines are much heavier than is really necessary, owing to the great difficulty of constructing such large wheels from light castings. Builders are obliged to make the segments very thick to insure good castings and to allow sufficient stock for finishing, and are generally sure to make all parts heavy enough to meet those ends, hence they get wheels that are too heavy.

A wood-rim wheel, constructed in the manner shown in our illustration, is heavy enough for regulation, and yet many times stronger than an all-iron wheel.

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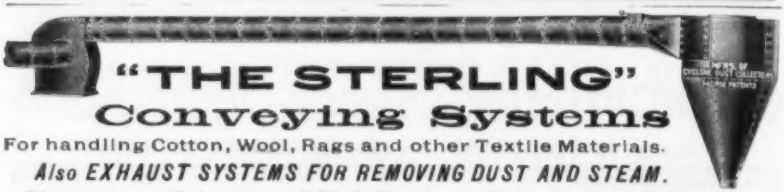

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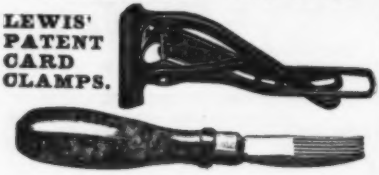
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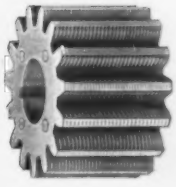

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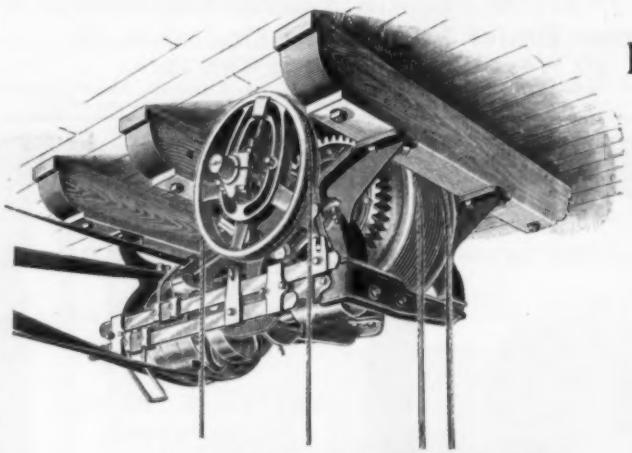

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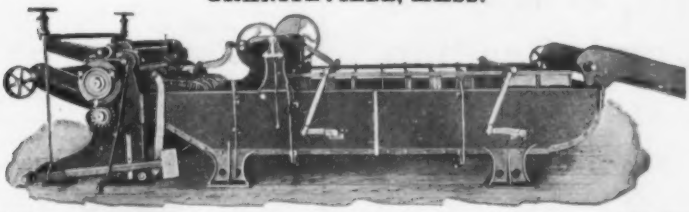

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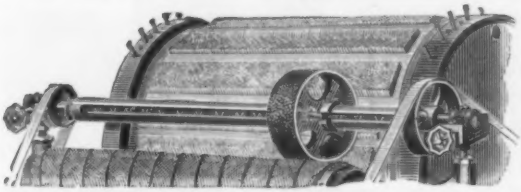

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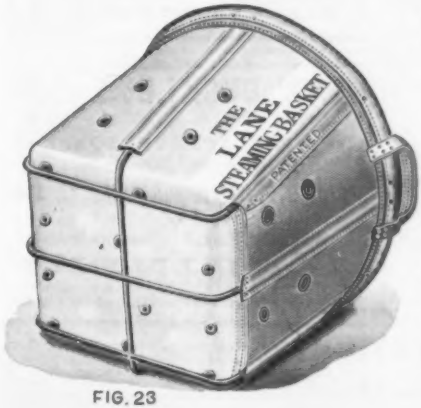

FIG. 23

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Here Is a Letter Worth Reading.

ALBANY, N. Y., Mar. 5, 1902.

GUILD & LORD,
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When we began to advertise Stephenson Bar Belt Dressing with you we had less than three thousand customers on our books, while to-day we have considerably over fifteen thousand.

Advertising alone could never have accomplished such results in the length of time that we have been calling the attention of your readers to our product, but good news travels fast, and so does the merit of a reliable article among well pleased users. Where it is tried and found to "fill the bill" that man tells his friend in a neighboring mill and so on.

While we have no reason to complain, still, from our standpoint the only wonder is that even more mills are not using our Belt Dressing.

We are more than ever convinced that nothing has yet been devised for use on slipping belts that can compare with it for convenience, efficiency and economy.

In one sense you know we have no competition. Being the highest priced preparation on the market sold for the purpose for which Stephenson Dressing has become famous, Viz., Belt Preservation and Slip Prevention, it stands in a class by itself and is not a sloppy mixture, nor does it require an expert to apply it to a belt.

Our business methods seem to meet with the approval of hosts of good friends in the textile field, and we would like to hear from one and all of your readers who are at all interested in keeping their machinery up to its full capacity for the minimum cost—results considered.

Yours very truly,
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Controls night Watchman.
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FOR
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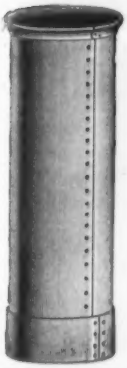
MACHINERY.
Roving Spindles and Flyers a Specialty.
Light Forgings. Repairing of all kinds.

SHEARS for finishing Cotton, Wool or Worsted Fabrics made in single sets or in several sets to finish face and back at one feed, saving space, time, cost. The Combined Shear and Roller for Carpets is an example. Baling and Finishing Presses. Presses for Straw, Felt and Buckram Hats. Shafting, Gearing. We grind or repair all makes of Shears. GEO C. HOWARD, Lansdowne, Delaware, Co., Pa.



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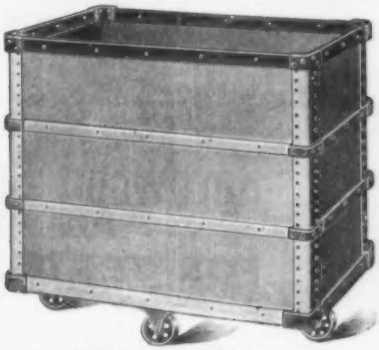
The "20th Century" Laminar Can.

Laminar Taper Box with hardwood shoes. Top View.



Laminar Car or Truck with Corners and Steel Top Rim.

Laminar Taper Box with hardwood shoes. Bottom View.

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These tiles and shingles are the most ornamental roofing material made in metal—are endorsed by leading architects and engineers for first class buildings, are thoroughly storm-proof and easily applied. Illustrated booklet showing buildings covered will be mailed to those interested, free.

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1901 PATTERN

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With Patent Variable Motion.

Winds from below and from 90" skeins direct to shuttle bobbins. Impossible to wind yarn any harder. Runs at high speed, gives large production. Cleaners attached, to rub off dross and loose fibres from the yarn.

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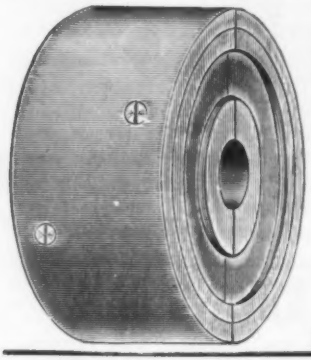

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Model of Pulley Sent Free of Charge.

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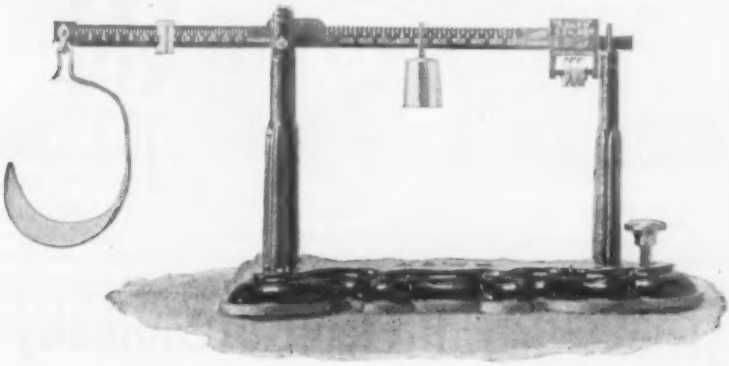
That will weigh by HALF GRAINS up to 1,000 GRAINS (over 2 1-4 oz.)



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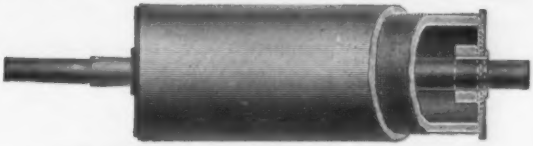

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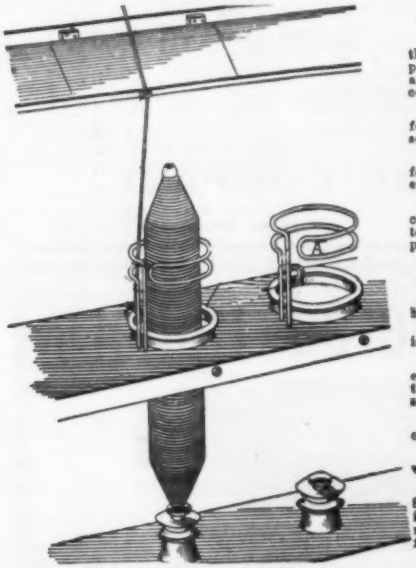

The following advantages are claimed for this protector.

1. The speed of the frame will be increased, and also the production; on frames without any protectors or plate separators about twenty-five to thirty per centum, and on frames with separators about twelve or fifteen per centum.

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3. The traverse of the rail can be increased from one-fourth of an inch to one inch, if frame permits, thereby enabling the use of longer bobbins.

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5. Frame and rail more perfectly balanced.

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7. The yarn is wound tighter and more uniformly on bobbins.

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10. The life of the ring will be prolonged on account of decreased friction.

11. No accumulation of lint, dust and dirt, which invariably results in the use of blade separators.

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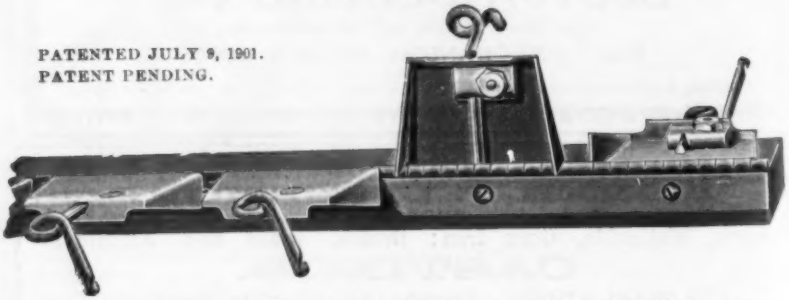

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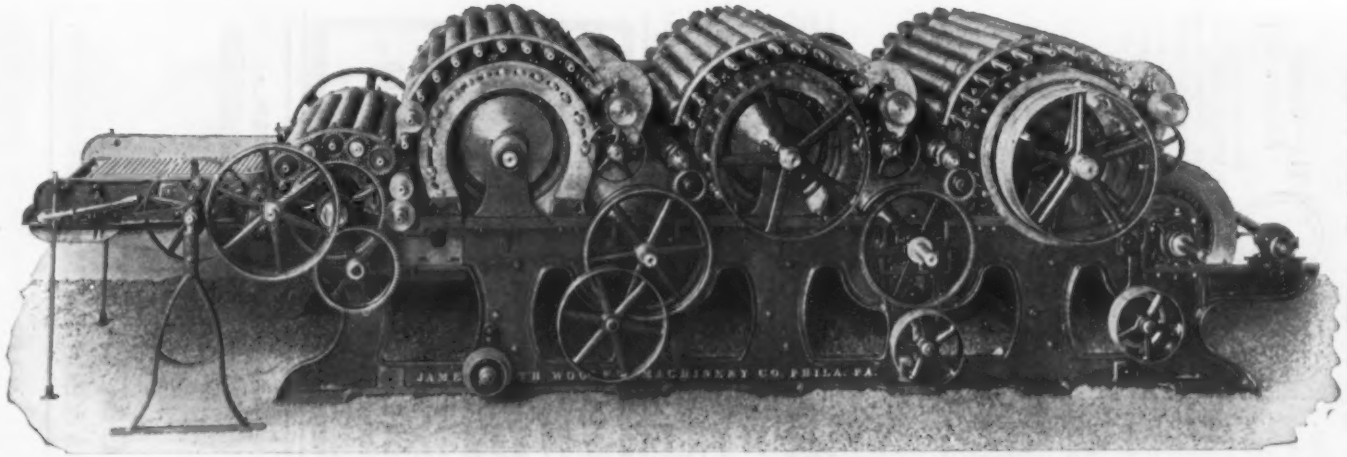

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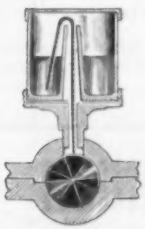

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Cloth Cutting Machine. 698,908. Frank Dodge, Boston, Mass.

Circular Knitting Machine. 698,549. Karl Palme, Philadelphia, Pa.

Cloth Cutter. 699,399. Robert E. Leve, New York, N. Y.

Filling-Replenishing Loom. 698,579. Wallace I. Stimpson, Milford, Mass., assignor to Draper Company, Hopedale, Mass., a corporation of Maine.

Fixing Dyes on Indigo. 700,521. Ernesto Lurati, Traun, near Lintz, Austria-Hungary.

Fibre-Separating Machine. 699,638. Samuel B. Allison, Galveston, Tex.; C. A. Dorrestein, administrator of said Allison, deceased.

Grinding Attachment for Carding Machines. 700,164. Joseph Audette, Detroit, Mich.

Kindergarten Loom. 700,636. Frances A. Foster, Sioux City, Iowa.

Knitting Machine. 699,930. William H. Sheridan, Pittsfield, Mass.

Loom Shuttle Check. 699,445. John C. Bryan, Augusta, Ga.

Loom Harness Motion. 700,613. Thomas Brindle and Merrill O. Steere, Pawtucket, R. I., assignors to Brindle-Steere Company, Portland, Me., a corporation of Maine.

Machine for Folding and Rolling Cloth. 698,458. Isaac Cohen, Philadelphia, Pa.

Manufacture of Figured Knit Fabrics. 698,499. Emil A. Hirner, Allentown, Pa.

Manufacture of Lace Representing Mosaic Work. 699,019. Ermans E. Saunier, Paris, France.

Multiplier Mechanism for Looms. 698,821. Arthur S. Cowan and Benjamin F. McGuiness, Worcester, Mass., assignors to Crompton & Knowles Loom Works, Worcester, Mass., a Corporation of Massachusetts.

Magnetic Feeler for Looms. 698,437. Charles P. Bostiau, Milton, Pa., assignor of one-half to Coleman K. Sober, Lewisburg, Pa.

Mechanism for Pressing Wool or the Like into Bags. 698,506. Alfred H. Illaingworth, Addingham, England.

Manufacture of Open Striped Hosiery. 699,964. Emil A. Hirner, Allentown, Pa.

Machine for Fixing Spangled Material to Textile Fabrics. 700,305. Robert Cornely, Paris, France.

Narrow Wear Loom. 699,977. Henry Riehl, Jr., Philadelphia, Pa.

Pattern Mechanism for Looms. 699,104. Arthur S. Cowan, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass., a corporation of Massachusetts.

Preparation of Collodoin for the Manufacture of Artificial Silk. 699,155. Jules Douge, Paris, France.

Process of Mordanting Animal Fibre. 700,284. Otto P. Amend, New York, N. Y.

Ring Spinning, Doubling, or Twisting Machine. 699,152. Phinehas P. Craven, Manchester, England.

Ribbon Loom. 699,878. Reynold Kohlhaas, Philadelphia, Pa.

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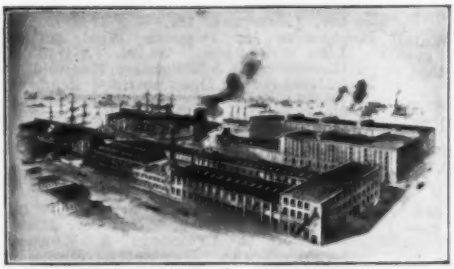

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Vol. XXII. JUNE, 1902. No. 6.

William Williams Castle.

William Williams Castle was born in Cleveland, Ohio, September 21st, 1843, son of Hon. William B. Castle and Mary H. (Newell) Castle.

His father was prominently identified with the business interests of Cleveland, being president of the Cuyahoga Works, now the Cleveland Shipbuilding Company. He was elected Mayor of Cleveland upon the first Republican ticket voted upon in Ohio in 1855.

The subject of this sketch, at the outbreak of the War of the Rebellion, left his studies and entered the military service. He did duty in Virginia for a short period, and afterwards was paymaster of the U. S. Military Railroads in Tennessee, and Georgia.

In the winter of 1864 he was made paymaster of the U. S. Navy. Resigning his commission, he returned to Cleveland, and entered into active business life with his father in the Cuyahoga Works, at that time the largest establishment engaged in the manufacture of engines and boilers west of the Hudson River, building land, marine, blast furnace, rolling mill and pumping engines.

In 1872 Mr. Castle went to Belfast, Maine, purchasing and operating the Belfast Iron Works, which were totally destroyed by fire in the conflagration of August, 1873. He rebuilt and operated the plant, and until 1880 it was the pioneer and sole establishment for the construction of granite working and polishing machinery.

Mr. Castle came to Massachusetts in 1882, and was first employed as superintendent of construction in the extension of the Sudbury river shallow flowage business by the City of Boston. He was also connected with the Thompson & Houston Electric Company, and designed and constructed the United Electric Light Company's station at Springfield, Mass., at the time the largest in New England.

Mr. Castle, at the request of the editor of a Boston daily paper, who desired information regarding the methods of examination in the U. S. Civil Service, was one of over 150 who were examined for admission into the civil service of the Government, which was supervised by Dorman G. Eaton, the godfather of the new law; this examination, held in 1883, resulted in his being the first clerk appointed in the U. S. Treasury Department in New England, serving some years as bond accountant in the Custom House at Boston.

Previous to 1890, there was no technically educated or experienced examiner of machinery in the appraiser's department at Boston or any other Port. The American manufacturers of textile machinery were feeling the competition of foreign builders keenly and, as this class of importations bore an ad valorem rate of duty, they made such representations to the Treasury Department at Washington that it was deemed important to the growing industry that the appraisement of values should be determined by an official possessing expert knowledge of that class of merchandise; a special examination was ordered which should embrace practical as well as technical knowledge of textile machinery.

While a large part of the importations was cotton and woolen machin-

ery, yet there were many classes of merchandise which would necessarily come to the examiner, and which required fully as great a degree of knowledge, such as flax, hemp, jute, silk, lace, knitting and sewing, netting and electrical machinery.

The examination was a severe one and required not so much a knowledge of any one class of machinery, as a familiarity with a great many, and even though a person might pass a creditable examination upon the general lines of questions formulated, still to be of material value to the Government in the assessments of duties, long years of experience is necessary and familiarity with foreign market value imperative.

The importations of machinery at the port of Boston are greater than at all the other ports of the country combined. There are many reasons why this is so. The freight both seaward and inland combine to make this port a favored one. The facilities for prompt transhipment, the proximity of the agencies of foreign manufacturers, the certainty of intelligent business-like methods adopted at this port of entry have secured for it a preference over any other.

As evidence of this, it need but be shown that the total amount of machinery which has passed under the examiner of machinery at Boston for the year ending January 1, 1902, was valued at over 2¾ millions of dollars, was packed in 32,500 cases, and that this year, 1901, has been an exceptionally light one in receipts.

Previous to 1894, the practice followed in the examination and appraisement of machinery was to order one case in ten to be opened at the appraiser's stores. This method was found to be defective, from the fact that it was an absolute impossibility to correctly determine the dutiable value of a complete machine by the examination of a few of its parts. The department while loath to change a practice, which had been followed for many years, upon the presentation of the conditions, however, directed Mr. Castle to formulate a plan of procedure, and in June, 1895, embodied his suggestions, by directions to the Treasury Department, Washington, these appear in the Synopsis of Decisions, Treasury Department, 16,135.

This new method of examination has at once been a great convenience and inexpensive method to the importer; has been the means of giving quick despatch to the mills with a lessening of breakage in transhipment and placing an accountability, should any damage occur, upon the proper parties; it has at the same time placed the Government in the best possible position whereby the actual dutiable value could be determined, as the appraising officer has an opportunity to view the machine set up, complete and ready for operation; in the majority of cases in operation.

Mills are not delayed by cases being held for examination, which was, necessarily, the result of having to pick out of a shipment certain specified cases; the time and labor required to do this may be readily understood, when it is known that often 600 to 1000 cases of machinery from incoming foreign vessels would be piled up on the wharves. None of those specified upon an invoice could be released until those specified for examination had been delivered at the appraiser's stores, contents scrutinized and passed as correct in value.

Even while the examination at the mill was a great accommodation to the manufacturer, for a long time (and such instances occur even at the present time), those in charge of the mills did not seem to realize the importance to them of this procedure; in many instances not understanding the necessity of a Government official being shown into their establishments and permitted to scrutinize machinery; to quote their own words, "we have paid for in full; and now have nothing to do with the Government." They

forget or do not know that under the law any imported article is constructively in the hands of the Government, and may be seized and removed at any time previous to the report made upon the invoice by the appraiser "value correct" and subsequent liquidation of entry.

Too frequently, also, an iron clad rule established by mill men that no unauthorized party shall be admitted into the buildings is not liberally construed as to the government representative, and often he is obliged to wait in an outer room for a length of time until the superintendent or some other officer be hunted up, notified by his card of his presence, and attended to when convenient, when the fact is that this method of examination is altogether in the interest of the mill and its owners.

Mr. Castle's duties in the examination of machinery necessitates his traveling from Maine to Texas, and from Massachusetts to the western portion of the Mississippi valley, visiting hundreds of manufacturing establishments. There is not in the country today a man who visits so many annually in the performance of his official duties. In proportion to the years he has been engaged in this service, he has probably been in more manufacturing establishments than any one in the country, and the labor entailed in traveling by day as well as night is no slight one. His long experience has brought about a familiarity with all classes of machinery, and his knowledge is by no means confined to machines used in textile manufacture.

He is compelled to keep for his guidance in making the correct appraisement, copious notes, which are of great value, and which, of course, are held by him as confidential to the fullest extent; from these he can instantly inform himself not only of the exact value of any particular piece of machinery at the time it was imported, but also who the importer was, where and by whom constructed, what its destination was, and the general description at the time of importation.

While his duties as appraising officer call for an extensive and highly technical knowledge of machinery, its construction, condition and operation and of the general and special conditions under which each machine was built, the successful performance of these duties also requires tact, knowledge of human nature and the ability to decide between conflicting interests so that the fairness of the decisions shall win the approval of both sides. It speaks volumes, therefore, for the ability, tact and integrity of Mr. Castle, that he has during his many years of service as appraiser, won and retained the confidence of the domestic and foreign merchants and manufacturers whose interests he has had in charge.

Mr. Castle has a beautiful home at East Weymouth, bordering on Whitman Lake. He is connected with several organizations and clubs, which, however, receive but little of his attention, owing to his governmental duties.

He has been for many years an enthusiastic Grand Army man, being at present Chairman of the Council of Administration of the Department of Massachusetts, Commander of Francis Washburn Post, 92, for the past three years, and a member of the Loyal Legion. He is an Episcopalian in faith, and in political creed a sturdy, stalwart republican. He has a married daughter and one son.

—In the biographical sketch of Samuel Webber in the May issue, we omitted to state that Mr. Webber was one of the founders and is now a life member of the American Society of Mechanical Engineers. He and his oldest son, Samuel, were present at the preliminary meeting in the office of the *American Machinist*, when it was decided to form this society, and his son acted as secretary at that meeting.

Monthly Comment.

The Visiting Cotton Manufacturers from England. The delegation of English cotton manufacturers has come and gone. In a private letter to us, one of the party expressed his satisfaction at the kind reception accorded them both North and South. Our manufacturers, as a rule, were pleased to submit their mills and manufacturing processes to the inspection of the Englishmen. The latter undoubtedly return home with a different idea of the American invasion and the threat to Lancashire that it carries. Possibly their alarm has been lessened by the visit to our mills. There is nothing so reassuring as looking a danger square in the face.

The Metric System. The bill to promote and extend the use of the metric system in this country has been favorably reported to the House of Representatives. At the hearing before the committee, a number of witnesses were examined, and a reading of the divergent opinions expressed is convincing in one respect at least, namely, that no action should be taken on this subject without further and exhaustive investigation.

The question has two sides. This is plainly evident from the fact that such men as John Quincy Adams, the astronomer Herschel and Herbert Spencer have placed themselves on record against the adoption of the metric system. The question affects the interests of the individual and the community to an extent but faintly realized by the advocates of this bill, which proposes to change the ideas of everybody as to the length, breadth, thickness and weight of everything under the sun. We suggested some months ago the appointment of a commission to investigate and decide as to this proposed change in our system of weights and measures. Such a commission should be composed of the ablest minds available, and broad enough to consider the needs of the plain people as well as those of mathematicians.

The Decline of Lancashire. Ten years ago, in 1891, there were 459,297 workers over ten years old employed in the cotton mills of Lancashire, England. In the ten years that have since elapsed, this number has declined nearly 5 per cent. to 436,677.

Contrast this evidence of decline with the growth of the cotton industry in the United States during practically the same period. In 1890, this country had 218,876 cotton mill employees. In the following decade 83,895 workers, over 38 per cent., were added, making 302,861 cotton mill employees in the United States in 1900.

A glance at our exports of cotton goods shows that the increase in our cotton manufacturing industry was accompanied by but a very slight increase in foreign trade in cottons. In 1890 we exported $10,000,000 of cotton goods; in 1900, $23,300,000. This, to be sure, is an increase of $13,300,000, but is very slight when compared with the increase in the value of the product of our mills, $71,206,895, in the same time.

From these figures it is evident that our growth in cotton manufacturing was due to an increase in the demands of our home market.

At the 1900 rate of production of cotton goods per employee in this country, $1120, this increase of $13,300,000 in our exports is equal to the product of but 11,875 employees, leaving the goods turned out by the other 72,110 cotton workers who were added to our industrial army in this ten years, to be consumed by our own people.

The gain of 11,875 cotton mill workers represented by the increase in our exports of cotton goods in this ten years can not fairly be compared with Lancashire's loss of 22,620 workers in practically the same time; first, because Lancashire's cotton mills do not

include the whole of Great Britain's production; second, because we have not the statistics to show whether Great Britain's loss in cotton manufacturing is due to a decline of her home or foreign trade.

The gigantic proportions of Great Britain's exports of cotton goods, $325,000,000 per year, affords ample opportunity for fluctuations that would equal the product of the 22,620 men, women and children who have disappeared from Lancashire's cotton mills since 1890. The value of England's yearly exports of cotton goods, $325,000,000, is but $14,000,000 less than that of the entire product of all the cotton manufacturing establishments in this country, and this small difference, $14,000,000, is more than counterbalanced by the lower valuation of English merchandise.

The Artificial Conditions in Lancashire. From what is the enormous product of English cotton mills made? Practically all their raw material is American cotton, of which we shipped to Great Britain in 1900 nearly sixteen hundred million pounds, valued at $134,465,663.

These figures carry their own instructive moral. Today Lancashire, a small section of a small island, in which cotton never can be raised, far removed from the markets for the finished product of her cotton spindles, is manufacturing cotton goods for all parts of the world. These are artificial conditions, made possible by the skill of English cotton operatives, the efficiency of English machinery, the organization of English mills, and the command of foreign markets.

America, on the other hand, producing by far the greater part of the cotton used throughout the world, apparently the only country where cotton for the world's wants can be raised, is importing yearly $40,000,000 worth of cotton goods, while exporting but $20,000,000 worth, thus failing to spin and weave the cotton product required by her own people.

These are not conditions to be satisfied with. Neither should any one in this country delude himself with the idea that we can capture this immense foreign trade of England and add it to the business of our own mills without the most systematic and determined effort on the part of our manufacturers and merchants. The prize is worth the effort it will cost. How is it to be gained?

First, by the thorough study and exploiting of foreign markets. Find what the foreigner wants and how he wants it. Then give it to him in just that way.

Second, by perfecting our manufacturing processes and equipment, and the practical training of our cotton mill workers in the school and in the mill.

Here is work for the merchant, the manufacturer and the school-master. They must march hand in hand.

There is danger in our thinking that this foreign trade will come to us with no special effort on our part. Let no one be thus deceived. The freight on cotton from New Orleans to Manchester, Eng., on the 8th of last March, was six cents per hundred less than from New Orleans to Fall River. Our growing the cotton is not necessarily an advantage over our foreign competitors.

Neither should we accept the fright of our English competitors regarding the American invasion, as proof that the victory is already ours. Only by patient, systematic and tireless effort can we enter into possession of our own, the supremacy in the cotton goods trade of the world.

Insurance Engineering. The value of property consumed by fire in the United States in 1901, is estimated at the vast sum of $150,000,000, or at the

rate of about half a million a day for every working day in the year.

The experience of the factory mutual fire insurance companies demonstrates that a large part of this vast loss could be avoided by proper precautions. The Boston Manufacturers' Mutual Fire Insurance Company, through its president, Edward Atkinson, has issued an appeal for support in establishing an experiment station, which, it is expected, will later develop into a school of insurance engineering in connection with the Massachusetts Institute of Technology.

The great value of the property consumed by fire is convincing proof that a wide field is open for work in such a department of education, and the object of the present movement is to make the prevention of loss by fire an applied science. The response for support has already been sufficient to ensure the establishment of the station.

The Grosvenor Shoddy Bill Again. Congressman Grosvenor has withdrawn his shoddy bill, doubtless unwilling to longer stand sponsor for a proposition so absurd, and has introduced a substitute.

The new bill provides that each manufacturer of or dealer in so-called "mixed goods" (that is, goods made from material that came directly from the back of a sheep and not from the back of a goat, camel or other noxious animal), shall pay a yearly fee for the privilege of making such goods; that, in addition to this fee, a tax amounting to one-tenth of a cent per pound shall be levied on all mixed goods and paid by the manufacturer, and that the manufacture of mixed goods shall be under the surveillance of officers and agents of the Internal Revenue Department, a surveillance practically the same as that now imposed upon the manufacture of cigars, whiskey and other spirituous liquors.

In other respects the second bill is practically the same as the first. None of the absurdities in the old bill have been omitted or modified.

It provides that government officers shall be fined and imprisoned if they fail to perform the impossible task of having imported cloths marked with the percentage of each ingredient.

Like its predecessor, it ignores the fact that no law can be enforced if violations cannot be detected.

It ignores what is self-evident, that after wool fibres are mixed together in cloth, no test, physical or chemical, can determine what part came by a direct and what part came by an indirect path from the sheep's back to the mill in which the cloth was made.

It ignores the fact that a large percentage of wool from the sheep's back is inferior to much of the so-called shoddy against which it pretends to protect the consumer.

It puts under the ban every textile fibre that did not grow on the back of a sheep. Here are a few of the fibres it stamps as inferior: Cotton, an American product which clothes mankind, makes the United States the envy of the world, and every nation our friend; silk, the most valuable and beautiful of all textile materials; mohair, the most lustrous and beautiful of animal fibres; hair of the camel, from which is produced the camel hair cloths whose soft handle and superiority are so well known; wool, regardless of its length, which has been through any process of manufacture.

All of these fibres come under the ban of this bill. They are sacrificed under the pretence that the consumer must be protected against the use of shoddy or woolen waste products, protected against materials that have been and are now of untold benefit to the human race, that have in great measure made human progress possible.

In reality, these fibres, cotton, silk, mohair, camel hair and waste wool, are to be sacrificed that the American wool grower may get a higher price for his wool, for which the American

people are now paying 30 per cent. more than it could be bought for in the markets of other countries.

The industry of converting woolen waste products into clothing, the shoddy industry, is safe from such attacks as this. This beneficent industry is protected by natural law, a law higher than acts of Congress, higher than Constitutions, above all human power. This natural law provides that when wool direct from a sheep's back is mixed with wool that has previously been subjected to some process of manufacture, and both made into cloth, no man can tell them apart. Even Grosvenor bills are of no avail against that decree of Nature.

But when wool or shoddy is mixed with cotton, the cotton can be detected from the wool and shoddy.

When wool or shoddy is mixed with silk, the silk can be detected.

Every reader of the Textile World is familiar with the means of separating silk or cotton from wool stock.

It is, therefore, the use of silk and cotton that is threatened by this bill. Shoddy or wool waste products are safe.

Such bills are not framed to become laws. They are, rather, the scarecrows of politics, exposed to public view until their absurdities become manifest, when they are taken down and other effigies as ridiculous as the first, but whose harmless character is yet to be exposed, are erected in their stead. This particular measure may, however, become a Frankenstein, that will destroy its creators.

Industrial Education. The work recently undertaken by Frank O. Carpenter, of the English High School, Boston, Mass., deserves the practical encouragement and support of every manufacturer, and particularly of every textile manufacturer. We gave an extended notice of this undertaking on page 961 of the May issue, and, briefly, it is this: It is intended to give instruction in the Boston schools as to the great industrial operations by which raw materials are converted into articles for the support and comfort of man. To this end it is necessary to have samples, as such instruction must necessarily be objective. Textile manufacturers can aid materially in this work by sending to Mr. Carpenter samples of material in the various processes of manufacture, together with a brief note of explanation as to what each sample is.

It is not intended that this course of instruction shall take the place of the technical schools. The idea is to give the young students a general but really practical idea of the world's industries with which they come in contact at every turn.

We urge our readers to aid in this work by sending to Mr. Carpenter such samples and information as they may be able to supply. It is important that instruction concerning the utilization of waste products be included in the course, and for this reason samples are desired showing textile waste materials of all kinds, together with samples of the products obtained from them.

European Hand Weavers. Industrial progress by which power machines take the place of hand work, involves great suffering on the part of those earning their livelihood by the old process of manufacture. Even in this comparatively new country, there is scarcely an industry whose history does not furnish an example of the hardships accompanying such a change.

In an old country like Europe, the suffering due to progress of this kind is much keener; just now millions of people depending directly or indirectly upon hand weaving for a living, are being slowly forced out of employment; each year sees the lessening of the number of hand looms in operation.

The distress caused by this gradual change was recently the subject of

discussion in the Prussian Chamber of Deputies; in reply to the request that the government adopt some measure to reduce the distress of the hand weavers, the minister for trade and commerce made a very plain statement, which showed what great efforts had already been made by the government to relieve the distress. At the same time, he took great pains to impress upon his hearers the fact that the government believed hand weaving to be doomed, that it was vain to hope for any other result, and utterly useless to postpone the inevitable end of this old industry.

The hand weavers had his fullest sympathy, but it was impossible for hand weaving to contend against machine work. He begged the opposition to aid the government in convincing the hand weaver himself that the time had come when he must look for other means of earning a livelihood.

The government has organized industrial schools for hand weavers who are skilled only in using the simplest kind of loom, to instruct them in operating more complicated machines. It has encouraged the building of better looms, in order that the life of certain branches of hand weaving which are not so seriously threatened by machine work, might be still further prolonged. These expedients have not, however, proved entirely successful.

He asked that all friends of the hand weavers unite in making it clear to those work-people that they must find other fields of labor. The government has sought to establish the industry of art needlework in the Silesia valleys, an industry for which hand weavers are well adapted. Good results have followed this attempt. It was a matter for congratulation that the transfer of the hand looms of the household to the factory was being rapidly effected. This fact would lessen the rapidity with which the industry of hand weaving disappeared.

The minister stated that the government realized fully the difficulty which old people experience in learning new trades, but the government could not help these conditions, although it would do everything possible to relieve them. In closing, the speaker said he would do what he could, but he begged them to recognize hard facts, and to persuade the sufferers to learn other ways of earning a living.

FOREIGN MARKETS.

We hear much less now than formerly about the necessity for foreign markets for our cotton goods, and yet that necessity is as great as ever. Several reasons may be assigned for the silence. First, the former agitation was mainly limited to talk, and people became tired of the discussion which led to nothing very definite. We might shout until black in the face,—"We grow cotton for the world and we shall soon spin it for the world," but such talk did not increase our exports a dollar's worth. Then again, the resumption of exports to China, following the settlement of the Boxer troubles, together with prosperity at home, has served to keep our mills fairly well employed.

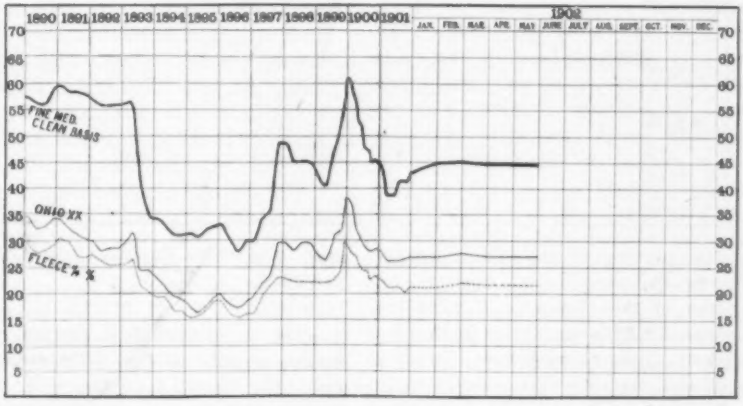
During the eight months ending with February of this year, we exported cotton goods to China valued at $10,094,836, as compared with $1,478,501 for the eight months ending with February of last year. The present exports of cotton goods to China is equal to over $15,000,000 per year, or over two-thirds of our total exports of these goods to all countries. With the door to China kept open we may expect this trade to increase.

The next addition to our cotton goods exports is likely to come from an increase of trade with Cuba and the Philippines, which now present the strange anomaly of being joined to the United States by close political ties, while their people obtain their supplies of cotton goods from other countries. According to the latest

government reports, Cuba is importing cottons at the rate of over $6,000,000 per year, of which less than 9 per cent. came from the United States. The Philippine imports of cotton, according to a report of the same date, were valued at over $7,000,000 per year, of which less than 1 per cent. came from this country.

Our share in the cotton goods trade of these islands is likely to be increased in the near future by the operation of the preferential rates provided by the bills now before Congress, whose passage in some form seems assured. But after the Cuba and Philippine markets are secured for our manufacturers by the aid of preferential tariffs, we shall be forced to meet the European manufacturer on equal terms or with the preference against us.

WOOL MARKET.



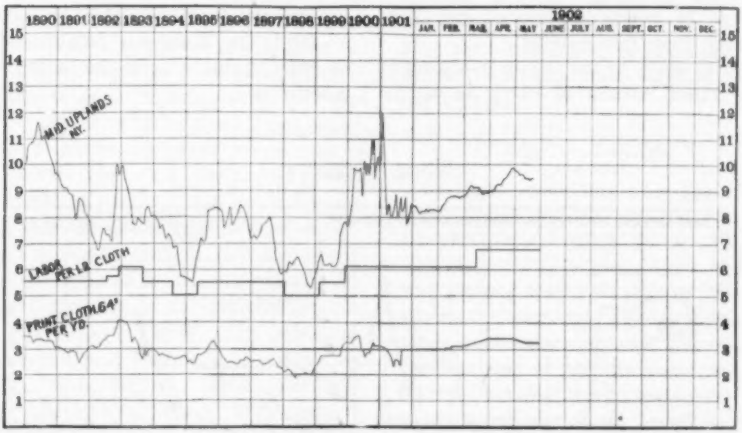
For the past month wool prices have remained unchanged, and transactions in the east have been small. In the west, the new clip has been rapidly transferred from the growers to dealers at prices slightly above the quotations in seaboard markets. The continuance of the strike in the mills of the American Woolen Co. has had considerable influence in keeping prices down and restricting transactions.

The foreign market is strong and the advance has been fully maintained. A noteworthy feature of the English market since January 1st is the relatively greater advance in the cheap wools. All grades have scored an advance during this period, but the fine qualities have not advanced so much, doubtless owing to the fact that the prices for coarse wools were unduly depressed at the close of last year.

The goods market has been quiet, as is the rule at this season of the year. The curtailment of production by the strike in the woolen and worsted mills, has resulted in many orders having been given to mills not affected by the labor troubles. It has also been the means of restricting cancellations. Last, but not least, it has caused the stock of goods to shrink, so that the season closes with no large accumulation of goods to threaten the next season's business. A hopeful feeling prevails in both wool and goods circles, and is founded upon the phenomenal prosperity of the country and the reasonable values prevailing for both the raw material and finished product.

The only danger that can now be foreseen is an agitation of the tariff which is not only threatened by the party out of power, but for which encouragement is now being given by the attack of the wool growers in congress upon the wool manufacturing interests.

COTTON MARKET.


1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
MID UPLANDS NY.
LARD PER LB
CLOTH
PRINT CLOTH 64" PER YD.

The feature of the cotton market during the past month was the decrease in the movement toward the seaboard. This was accompanied by slightly firmer quotations in the southern markets than elsewhere.

The trade takes this as an indication that the old crop is approaching exhaustion. While prices naturally reacted from the high point reached at the beginning of last month, this reaction was not sufficient to deprive this country of the boon of high priced cotton, or to induce free purchases by manufacturers.

The acreage planted this season is likely to be large. No confidence can be placed on the impartiality of estimates made by individuals, although such reports are widely quoted and serve their speculative purpose.

The Chronicle reports the world's visible stock on May 23d at 3,229,170 bales, as compared with 3,366,132 bales on same date last year, 1901, 2,481,552 bales in 1900, and 4,524,070 bales in 1899.

Egyptian cotton has ruled strong at high prices, in sympathy with the general market and the popularity of goods for which Egyptian cotton is a necessity.

—The U. S. Consul at Harput, Armenia, reports to the State Department the recent appearance in that market of a very clever imitation of the leading brand of American sheeting, the Cabot A, well known and highly valued throughout the Orient. Recently, merchants there have displayed an imitation, stated to be of Italian manufacture, which has deceived many buyers. The price per piece of 40 yards is $2.52½, as opposed to the current quotations of $3.05½ for the genuine Cabot A. Close inspection is required to detect the inferior quality of the fabric. The trade-mark misleads readily. It reads "Dwright Cabot A," instead of "Dwight Cabot A," while the design of a goat replaces the eagle of the registered trade-mark; this article has practically driven the genuine Cabot from the market of Aleppo. This consulate has called attention to the effort at deception, and the manufacturers of the American article have been duly notified, a sample being forwarded to them.

Seasonable Fabrics.

MEN'S WEAR WOOLENS.

While the general market presents a quiet and uninteresting appearance, general conditions are fairly satisfactory and notwithstanding the unsettled state of the market during the past few weeks, due to the labor troubles, more business has already been booked by agents than was the case up to the same date last season.

It is true that last season a great deal of conservatism was displayed by buyers and the inclination was to hold back awaiting developments, with the result that the early business was rather discouraging; this season, however, the conditions were exactly reversed at the opening and a good volume of early business was booked without any difficulty, more particularly on the lines of woolens, and the American Woolen Co.'s mills strike coming on a little later enabled the outside manufacturers of fancy worsteds to sell up their production to good advantage with the result that the majority of them are now in good shape and not anxious for a great deal more business.

It is true that considerable anxiety is felt by some of the outside manufacturers as to what the result will be in the way of cancellations, if the strike should be partially or completely broken in the near future. The reports of the steady gains of the American Woolen Co.'s mills over the ranks of the strikers has certainly had a tendency to check the placing of orders with outside mills as substitutes for goods previously purchased from that company, but as yet no general tendency in the way of outside cancellation has been shown, although some inclination in this direction has been displayed by some of the clothing manufacturers.

It is of course too early, as yet, to look for many duplicates on heavy weight goods, and the light weight samples not having yet been opened up makes this particular time a distinctively "between-seasons" period. It is generally expected, however, that the lines of light weight samples will, in the majority of cases, be ready much earlier this season than usual, and it is expected by some that the general opening will take place about the first or second week in July, although this date seems almost too early. Little can be said as yet as to styles for the coming season, but no radical changes are looked for.

WOOL DRESS GOODS.

The demand for thin, sheer fabrics and goods on the voile or etamine order still continues and the demand on goods of this description cannot be supplied. Everything, however, has been wanted in plain colors, with not the slightest indication toward a return to fancies. Navy mohairs and Sicilians have been in excellent demand, large quantities of this class of goods being used for bathing suits for the coming summer season.

For the fall season, Sicilians, etamines and goods of a similar character in the heavier weights, have been the popular fabrics, also Prunella cloths and zibelines with close sheared surface. Practically nothing in the way of fancies are being taken with the exception of a few small, neat effects in checks or stripes, in blacks and whites, particularly.

WHITE GOODS AND COTTONS.

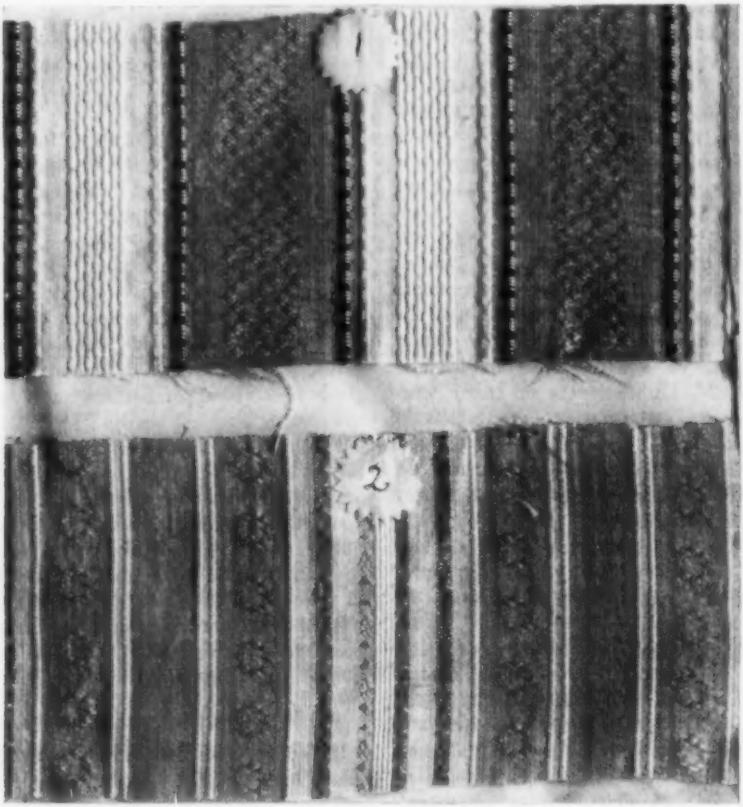
This has been distinctively a white goods season and the market on goods of this description is in excellent shape. Desirable fabrics in the higher grades are difficult to procure; in fact little in the way of desirable white goods can be found anywhere in the market. Already considerable interest is being manifested in the new lines for 1903, and a fairly large volumes of business has been booked, more particularly on the higher grade woven fancies, although good sized orders are also reported on plain fab-

rics, such as India linons in the higher grades. Piques are again in fairly good demand, although it is not anticipated that they will be as popular as they were two or three seasons ago, when the demand reached such enormous proportions.

There has been little change in the tone of the market on staple cottons.

PRINTS, GINGHAMS AND COTTON DRESS GOODS.

While the season's business on wash goods of all descriptions has been fairly satisfactory, it has hardly come up to the early expectations of the majority of manufacturers and merchants. The early opening of retail stocks and the prolonged unfavor-



Buying has been conducted on a moderate scale, with a tendency toward conservatism, evidently with the idea in view that better prices will be made in the near future as a result of the tendency toward a weakening in the cotton market. In heavy brown sheetings and drills, sales have been hardly up to the average, and the market on bleached muslins is quiet.

able condition of the weather throughout the spring, retarded trade considerably and dampened the enthusiasm of the retailer. Notwithstanding this condition, the market is fairly well clean of high grade goods and considerable attention is being devoted to lines for fall.

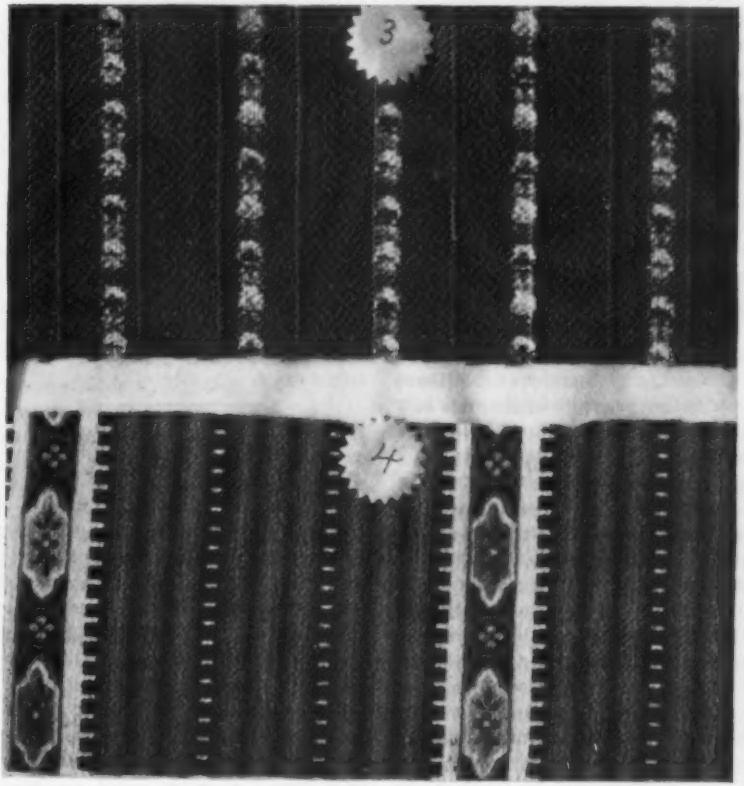
Sellers are not making open quotations on standard lines of fall prints,

but the prevailing price is 5½ cents for such standard lines as Simpson's, Cocheco, Merrimack, Windsor, etc. In lower grades, some business has been booked at 5 cents, but these lines are what are known as "second grades."

Mackinaw twills are quoted at 8¼ cents, and continue to hold a strong place in the market. Black Hide twills are held today at 7¼ cents and continue to grow in popular favor. A few new styles have been added to their already extensive lines.

High grade woven fancies in silk mixtures have been in good demand throughout the season, and some very artistic novelties have been produced by some of the leading manufacturers. Figs. 1 and 2 illustrate two of the creations of the Lorraine Mfg. Co. of which they have no difficulty of selling all they could make at 45 cents. These cloths represent the highest point of excellence yet reached by domestic manufacturers of cotton fabrics.

For the fall season, printed cotton flannels are being extensively bought and some very handsome designs are being shown. The Rosetta Cloth made by the Windsor Mills and sold at 12½ cents, less 10 per cent., in 28-inch width, has been a successful production and has been favorably received on all hands. One of the small, neat designs, typical of this cloth, is shown at Fig. 3. The Eclipse Mills flannel of the Arnold Print Works, which met with such great success last season, is again being shown for the coming season in a variety of new and attractive patterns, one of which



is shown at Fig. 4. The price of this fabric this season is 11¼ cents in 34-inch width. Among the lower priced cloths of this description, the Beaver Mills brand of flannel of the Arnold Print Works sold at 9 cents in 28-inch width, occupies a prominent place in the trade.

SILKS.

The continuation of the strike of the silk dyers' helpers at Paterson contributes to the general quiet of the silk market and little interest is manifested in any direction. Not knowing how long this strike may continue, buyers are backward about placing orders when deliveries cannot be assured.

So far as the general trade is concerned, however, the strike could hardly have come at a better time, and taking everything into consideration, it is not to be looked upon as an altogether unmixed evil. Agents are of the opinion that the strike, by preventing the accumulation of goods on the market, will thereby enable them to get better prices than if looms had been running on full time and stocks accumulating.

It is generally admitted that the prices of silk piece goods have, for some time, been altogether too low, and, if the strike continues for some time longer, the resulting shortage in the market will give manufacturers and selling agents the desired opportunity to advance their prices and these advances should be adhered to after the labor troubles are over, providing, of course, that other market conditions warrant the maintaining of advanced prices.

The frequent recurrence of labor troubles in the Paterson district will undoubtedly result in manufacturers looking for mill locations in other sections where they are less liable to experience such trouble; although the expense of doing so will be very great, it may be the cheapest plan in the end.

Sheer silks are in good demand for spot delivery, and a strong request has sprung up for greens, more particular in taffetas. Velvets will undoubtedly occupy a strong position for fall, plain colors, of course, being the best, although a few fancies are being bought, but only in neat, quiet effects. Metal prints in velveteens will also be a strong feature of the fall season and panne velvets will continue good both in plain and fancy patterns.

Le Moniteur des Echantillons de l'Industrie Drapiere.

We are advised by the publisher of Le Moniteur des Echantillons, for which we are the American agents, that the cloth samples for the current season, which ends with June, are exhausted, and, consequently, no more of these numbers can be supplied.

Future subscriptions to this journal, which has already proved so popular in this country, will, therefore, be for the new season, which begins with July.

A Systematic Collection of Samples for Designers.

A record of fabrics and weaves is essential to every designer. The best memory can retain but a faint impression of a small portion of many weaves met with in years of experience. It is, therefore, essential for designers to arrange in systematic order for future reference, a record of the weaves and fabrics they have met with, so that quick reference may be made to any one, when desired. In this way the experience of years may be made available. Experience that cannot be used is of no value, and a designer's experience without a written record is of but little use. Upon a systematic record of fabrics and weaves depends the value of an experienced designer.

But if a systematic record of one man's experience as a designer is of so much use, how much greater must be the value of such a record of the

experience of many workers in this art. It is this last named record of the woolen and worsted industry that N. Mockel, of Aachen, Germany, has sought to compile in the three following works:

The first is entitled: A Collection of Weaves, and contains 1644 chain drafts for both light and heavy fabrics, adapted for men's wear. These are illustrated by 336 cloth samples for which full particulars are given as to size of yarn, threads per inch in warp and filling, width in loom and reeding of the warp. The samples are neatly mounted on cards. The weaves are given in a well bound volume and the whole work is enclosed in a substantial portfolio. The price is $15.00, delivered in the United States or Canada; price without cloth samples, $7.50. Over 150 European mills have already secured this collection, a fact which indicates its value.

The second work is entitled: Method of Designing Weaves by Four Changes. It is a collection of 324 pique weaves designed by a novel method, which might be described as an application of the kaleidoscope principle to a ground weave, four other weaves being thus obtained. The collection is of great value to the designer, and the method by which the changes are effected will repay study, and is probably capable of more extended application in designing. Eighty cloth samples illustrate the text, and fabric particulars are furnished for these samples. The price of the complete work is $5.00; without cloth samples $1.00.

The third work is entitled: Mockel's Collection of Reform Weaves. It gives 304 weaves, constructed on what in Europe is called the reform principle; in these weaves the same threads serve for both back and face warp; 100 cloth samples, for which fabric particulars are given, illustrate the work. This method of weaving, which is extensively used in Germany, should be studied by every designer. The price of the complete work is $7.00; without cloth samples $1.50.

The fourth work is entitled: Universal Weaves, and gives 202 weaves, illustrated with 54 cloth samples, for which fabric particulars are given. These weaves have a separate set of threads for the back warp, which rise to the face at certain intervals and thus alter the original effect of the face weave. Less threads per inch are employed than is required for ordinary and reform fabrics. The price of the complete work is $5.00; without cloth samples $1.00.

In all four of these works the samples speak for themselves. The chain drafts are of the same style employed by American designers. A key is furnished by the Textile World by which the German words used in the fabric specifications can be readily understood by English readers. Orders for these books, as well as subscriptions for Le Moniteur des Echantillons de l'Industrie Drapiere, published by the same firm, are received at this office. The last named journal is issued every two weeks, and during the season of six months, 400 samples of men's wear woolens and worsteds of the latest European designs are supplied, together with full weaving particulars, including size of yarn, threads per inch, width in the loom, reed and drawing-in and chain drafts. The subscription price per season is $15.00. Samples of the books and this sample journal can be seen at this office.

—The General Appraisers of Customs have decided that mufflers of silk and cotton, cotton being the component material of chief value, are not dutiable as "mufflers composed of cotton," or as "cotton cloth," but as "mufflers composed wholly or in part of silk." Another decision of the Board provides certain cotton cloths ornamented with figures produced in the process of weaving, with the aid of the jacquard, swivel, drop-box, leno, or other loom attachment, are

classed as "cotton cloth in which other than the ordinary warp and filling threads have been introduced in the process of weaving to form a figure," within the meaning of paragraph 313, tariff act of 1897, and are accordingly subject to the duty prescribed in that paragraph, in addition to the duties levied on the goods by virtue of the so-called countable clauses.

The Contest with Europe.

Editor Textile World:

I desire to submit a criticism or reply to the leading article in your May issue, "As Europe See Us." The introduction to the extract from Dr. Grunzel's lecture ends with the remark that the lecture "shows how clearly the power of America is understood and how patiently and systematically it is to be met," and the comments are prefaced by characterizing the quotation as "a faint idea of the systematic attack and defense that commercial (why not industrial, also?) Europe is to employ in what far-seeing men consider to be a life and death struggle with America."

Our side of the situation is summed up in the sentences, "The contest for which Europe is apparently preparing will be a contest between the arbitrary and puny commercial treaties of Europe and the great forces of natural production. A contest of man with nature, whose final result cannot be doubted."

Now, it appears to me that the conclusions drawn from the facts as stated are inadequate, if not actually misleading, the proper application not being made or lesson pointed. Before supplying this deficiency it is necessary to call upon history and experience, in order to show past and present conditions, enabling judgment to be formed as to causes which produced changes heretofore, thereby justifying the assumption that like causes will produce like results in the future.

Germany is acknowledged as the most progressive industrial nation in Europe at the present day, yet her natural advantages are not to be compared with those of several other continental states, France or Russia, for instance, while England, which held the lead of the world in manufacturing and commerce, is being hard pressed by her in all markets, including her own.

This transformation is of very recent growth; until the masterful genius of Bismarck welded the disunited German states into a powerful empire, Germany played no great part in international affairs, either politically or industrially. As late as our Centennial Exposition of 1876, her own commissioner, Prof. Reaulau, pronounced her manufacturing exhibit "schlecht und billig"—poor and cheap. These words at first were bitterly criticised by the German press and public, but sober second thought found them justified and the needful remedy was sought and applied.

If, as has been stated, the German schoolmaster won the victory of Sedan, it is the German technical school that has won successes in every market of the world and in nearly every branch of production. So thoroughly have they done their work that the cotton yarn spun in England is now returned to England in manufactured products, while an entire great industry, that of aniline dyes, has been exploited to the profit of Germany although originally based on an English invention.

The poverty of the soil and the people of Germany have been more than counterbalanced by scientific research, systematizing of educational and manufacturing processes, the application of art to industry, raising the value of the product incommensurably to that of the raw material. Let us call to mind the magnificent iron gates and the artistic porcelain sent by Germany to the Columbian Exposition at Chicago, as denoting high-water mark

in what may justly be styled a renaissance of German industrial production.

The United States excels in mechanical invention, machinery, transportation—in artistic products it has heretofore, with a few notable exceptions be it said, lagged behind. It is at this point that the article I have chosen for my text fails to point the proper moral. Rich as our country is in the expanse of its territory, fertility of soil, variety of climate, and, consequently, of products of the soil, these advantages supply only the raw materials for commerce and industry.

The fact that a country in no comparable degree favored as we are in these important particulars, should yet be able to make the giant strides that Germany has within a generation, should lead us to examine the causes of her success, to learn if there be a lesson therein, even for us. Such examination, I hold, would lead to reflections other than the high-pitched optimism which points with pride to what nature has done for us and overlooks what man neglects.

The inventions of American mechanical genius are increasingly adopted by our industrial rivals; the utilization of water-falls for the production of electrical energy has made great progress in Switzerland and Italy; the great plains of Russia, in Europe and Asia, are capable of lessening our supremacy in cereals; even now, England is to be supplied by a great American inventor with cheaper iron ore than she has had in many a year.

It will not do, therefore, to rest proudly confident of the superiority of our natural resources, least of all can a technical journal omit to heed the lesson which Germany has given, that the deficiencies of nature's prodigality can be supplied by science, training and art.

On another page of your journal the statement appears that the days of natural indigo are numbered, this product following in its decadence those other natural dyes, madder and cochineal, which had been used since the remotest past. Indigo is produced where nature is bountiful and labor abundant and cheap, yet the unremitting toil of the scientific investigator in his laboratory, situated in a rigorous northern climate, has distanced even the fruitfulness of the tropics and the skill of the German chemist has far-reaching results in England's Indian empire. How the sugar production of the Antilles and our own southern states has been rivaled by that which science has evolved from the beet, is so well-known that I need not elaborate on the subject.

To sum up, therefore, the lesson I would draw from the facts presented by Germany's transformation from an agrarian to an industrial people, and by her successes in commerce and industry, is to point out the crying need in this country, for thorough, systematic training in technical schools and the application of art to industry. It is the very contrast of the paucity of resources on the one hand and the almost illimitable riches on the other, that compel the thinking observer to search for the cause of Germany's noteworthy advance in the industrial sphere. And here one, alive to the forces at work to supplement nature's deficiencies in the old country, finds opportunity to benefit the people in the new.

Not one article, a whole series of them are needed to adequately set forth the provisions made for the training of youth in the various branches of industry in every European country. Little states like Bavaria, Wurtemberg, Switzerland, will be found to have in active operation an organization for technical instruction outnumbering many times anything of the sort in our great country. These schools are arranged to cover the entire field of industry, from those designed merely to supply the preliminaries useful for apprentices, through intermediate to the

highest graded schools, fitted respectively to develop superior workmen, artist-artisans, superintendents, designers or managers.

These schools are specialized to meet the varying wants of differing industrial centres, as schools for weaving, dyeing, knitting, textile designing, in hosiery and knit goods districts; those teaching wood-work, carving and design suited for furniture and ornamental wooden ware, where these branches are most cultivated; glazing, enameling, china-painting, in the pottery districts, and so on. The institutions of superior grade are in connection with industrial museums, giving students access to typical products of the best periods, while all are based on drawing and designing, as the foundation of any original work.

As illustrating the fact that American designs are as yet by no means the equal of European in the textile branches, a remark lately published in a journal representing the dry goods trade comes in pat. The manager of a leading department store is reported as being asked, what would be the result if foreign textiles were placed before the American buying public on terms of equality with the native product. "They would walk away with it," he said. Now, it cannot be denied that the American buyer, probably the most liberal in his outgoes of any, is entitled to the pick of the market in every branch of production; his money should enable him to acquire the choicest products of human skill and taste, and an increasing share of such should be produced in American work-shops.

To best utilize the bounty of nature and the intelligent industry of our citizenship the arts of design need to be brought to all our manufacturing districts, industrial museums established in leading centres, the value of art education recognized and applied by our manufacturers to an altogether greater degree than has heretofore been the case.

The article in view closes with the sentence "a contest of man with nature, whose final result cannot be doubted." That say I, too, but with a difference: in the progress of the ages man has subdued nature to his uses and with increasing knowledge and utilization not only of natural forces, but of all the powers of his mind, the conquest of nature will be rendered more complete, bringing added sustenance, comfort and happiness to man.

MAX LOWENTHAL.

Rochester, N. Y., May 26th, 1902.

The article, "As Europe See Us," was written to call attention to Dr. Grunzel's lecture and the threatened plan of campaign with commercial treaties by Europe against the American invasion of her markets. We agree with the views of Mr. Lowenthal and have repeatedly called attention to the conquests of German chemists, of which a notable example is found in the production of artificial indigo.—Ed.

Southern Cotton Spinners at Charleston.

This sixth annual meeting of the Southern Cotton Spinners' Association was held at Charleston, S. C., on the 8th of last month (May), and too late for notice in our May issue.

President J. H. McAden presided. Referring to the tendency of Southern mills toward better goods, he said:

"The south is making rapid progress in the character of its production. With our modern equipment and good labor we are able to compete with the world. I present you some beautiful specimens of silk-like fabrics made entirely from cotton cultivated in Louisiana, combed, carded and spun in a North Carolina mill, which will equal in production and in quality the product of any mill in the country."

Papers were read as follows: Cotton Mill Waste, E. W. Thomas, Cooleemee, N. C.; Water Power, George E. Ladshaw, Spartansburg, S. C.; Electric

Power Transmission, W. B. Smith Whaley.

The report of the secretary and treasurer, C. B. Bryant, showed the association to be in a prosperous condition, the membership being at high water mark.

The following officers were elected: George B. Hiss, Charlotte, N. C., president; Thomas M. Swift, Elberton, Ga., vice-president; and C. B. Bryant, Charlotte, secretary and treasurer. To fill vacancies in the Board of Governors: Dr. J. H. McAden, E. A. Smith and E. W. Thomas, for three years; E. Lang, for one year. W. C. Heath of Monroe, N. C., was made chairman of the Board of Governors.

Charlotte, N. C. was named as the place of the next annual meeting.

At the Charleston Exposition.

The Charleston Exposition, though smaller than any previously given in the United States, was admirably arranged as to details. The grounds were beautifully laid out, and the architecture of the different buildings varied and pleasing.

As there was no building set apart for textile industries, the exhibits in this line appeared here and there in the different buildings, for the most part in the Palace of Commerce, and the South Carolina building.

In the latter building, the floor space was divided among the different counties of the state, and a generous rivalry evidently existed as to which county should have the best exhibit.

The Georgetown county booth was specially noticeable, as it represented the locality in every detail, the woods entering into the construction of the division being native to the county, the design and cabinet work, which were very handsome and attractive, being from the hands of Georgetown architects and cabinet workers.

The adjoining exhibits of both Darlington and Spartanburg counties were very interesting, and displayed a wide range of resources and ability.

In every county display there was sure to be an exhibit of the product of some cotton mill, for a South Carolina county without a cotton mill is the exception rather than the rule.

Near together, were machinery exhibits of the Hardy Machine Co., of Biddeford, Me., whose card grinders are seen in every mill in the country; an elaborate exhibition of the machines of the Universal Winding Co. of Boston, and in a large space was seen the Invincible Automatic Knitting machine of the E. Jenckes Mfg. Co., of Pawtucket.

Next in line was a very handsome display of knit goods manufactured by the W. H. Rowe Knitting Co., of Amsterdam, N. Y., and Huntsville, Ala. The Rowe Company were distinguished by having the most handsome display of knit goods at the show, smaller exhibits being made in that line by W. Scott Harvin of Manning, S. C., and the joint exhibit of American manufacturers included a showing of knit goods made at the Mayodan Mills.

The round bales of cotton and the machines of the American Cotton Company for unwinding same attracted a great deal of attention, and in close proximity came the joint exhibit of American Manufacturers, a cabinet display of manufactured cotton goods that represented the product of nearly every well known mill in the South.

In the South Carolina building there was an interesting collection of souvenirs and relics of the Civil War, and these cabinets contained battle flags, uniforms, swords, autograph letters of distinguished men, bits of cloth, samples of large pieces of cloth carded, spun and woven by women of the South during the stress of war times, and many other articles equally varied and interesting.

In the space allotted to Berkeley County appeared the exhibit of the Woodstock Hardwood and Spool Mfg.

Co., of Charleston. This company makes spools, bobbins and all the varied articles that are used in spinning and card rooms in the wood work line, and their exhibit was thoroughly indicative of their line, being a pagoda constructed of an immense spool for the base, surmounted by, and the roof being supported with, equally good sized bobbins. Hooks were attached to the woodwork and the different articles of their manufacture suspended from them. The Woodstock Company have been in business but a year and a half, but have had a flattering success, their accounts extending since the beginning to present patrons in seven different states.

In the division of Darlington County, the Southern Novelty Co., of Hartsville, dealers in spinning room supplies, have a booth, the thatched roof of which is composed of paper cones and tubes.

In an adjoining county space, the Springstein Co., of Chester, show their line of ginghams and cheviots, and across the aisle in Spartanburg, the Andrews Reed and Loom Harness Co. have two framed displays of their goods.

Although the majority of the different exhibits in the line of manufactured goods are naturally the product of Southern mills, there are a few notable exceptions. Among these were the Standish Worsted Co., of Plymouth, Mass., who have an octagon cabinet filled with a fine line of suitings; from far off Colorado is shown a case containing samples of cotton goods made by the Overland Mills, Denver; the Peacedale Mfg. Co., of Rhode Island, who give an exhibition of their cloths, rugs and golf goods.

The American Net and Twine Company of Boston and New York give an elaborate showing of everything and anything in the net and twine line, and near to them Harding, Whitman and Co. have a small but comprehensive display of cotton yarns.

The Buffalo Forge Co. had a fine exhibit of their machinery.

The Government gives a series of exhibits from the different departments that for wholesale instruction and interest beggars description. These displays are placed in the courts that connect the larger buildings of the Exposition, and days could be spent in their study, with interest and profit.

The grounds where the Exposition has been held have been bought by the city of Charleston, and will be laid out and maintained as a park. It is said that the present Art Building, and the Maryland Building, one of the most attractive of the many state buildings, will become permanent features.

A visit to Charleston would not be complete without seeing some of the many points of historic interest that are in and near the city. A sail down the harbor, and electric ride across Sullivan's Island to the Isle of Palms, give one the opportunity of seeing at close range places of such world wide interest as Fort Sumter, Fort Moultrie, and James Island.

The Isle of Palms, a popular shore place with the people of Charleston, has a magnificent water frontage and enjoys the reputation of being the Coney Island or Nantasket Beach of the South.

The Lane Canvas Mill Basket.

The cut herewith shows the oblong taper style of the Lane Canvas Mill Basket, which is being adopted so extensively by basket users.

Though the Lane basket has by this time become generally known among the mill trade, we think a few words as to its construction and merit, for the benefit of such as may not have seen it in use, would not be out of place.

The idea here illustrated was de-

veloped several years ago by the manufacturers and patentees, W. T. Lane & Brother, of Port Chester, N. Y., who, from time to time, have discovered and added points of value, until now the Lane basket is acknowledged by many of the largest basket users to be the most economical, convenient and practical basket on the market.

The construction of this basket has been planned with a view to producing an article of great durability, so as to withstand not only the legitimate, every-day wear, but the abuse to which the mill basket will be inevitably subjected. In this vital point the manufacturers have succeeded to a surprising degree, and have not sac-

FIG. 20.

rificed other important qualities, such as lightness, tightness and simplicity of make-up.

The materials used in this basket are of the highest grade procurable. The canvas is of the best, extra heavy quality, and the frames are of spring-steel rods, made without welds of any kind, experience having shown welding to be unsatisfactory. Hardwood, renewable shoes take the bottom wear and a binding of the toughest leather protects the rim. Any shape and dimensions are furnished.

Messrs. Lane & Brother have been compelled, through the rapidly growing demand for their basket, to increase their facilities for its manufacture and are now in a position, with improved machinery, to turn out a more perfect article than ever before. They will be pleased to furnish further information on the subject, or to submit samples.

National Association of Woolen and Worsted Overseers.

SEMI ANNUAL MEETING.

The semi annual meeting of the National Association of Woolen and Worsted Overseers was held in the United States Hotel, Boston, Wednesday, May 21st.

The meeting was called to order at 10.40 a. m. with the president, C. M. Hurst of Providence, R. I., in the chair. Minutes of the previous meeting read and approved as read.

The following applications for membership were read and elected active members, viz.: Isaac S. Brooks, finisher, Tilton, N. H.; John Wilkinson, weaver, Clinton, Mass.; James J. Morgan, second carder, Maynard, Mass.; F. H. Ballou, assistant superintendent, Maynard, Mass.; Thos. E. Smith, weaver, Mechanicsville, Ct.; James Claven, carder, Mechanicsville, Ct.; Alfred J. Cox, spinner, Mechanicsville, Ct.; Wm. H. Stopherd, Lowell, Mass.; J. H. Horsfall, dyer, Lowell, Mass.; Alexander S. Taylor, weaver, Lowell, Mass.; Hiram Rathburn, superintendent, Stafford, Ct.; James P. Tobin, dyer, Stafford Springs, Ct.; Joseph Wood, dyer, Pittsfield, Mass.; B. H. Curley, carder, Pittsfield, Mass.; Julius Gyllensward, dyer, Peacedale, R. I.; C. A. Curtis, superintendent, Woodbury, Ct.; Geo. A. Parent, spinner, Moosup, Ct.; Wm. E. Ahern, spinner, Worcester, Mass.; Asa Gruth, carding and combing, Fitchburg, Mass.; Frederick Pfieffer, instructor of weaving Philadelphia Textile School; Geo. R. Kerman, finisher, Conshohocken, Pa.; T. J. Ryan, finisher, Putnam, Ct.; E. H. Boyce, finisher, Fall River, Mass.; Wm. H. Lacy, designer, Putnam, Ct.; Albert Lomas Sprague, designer, Uxbridge, Mass.; A. C. Wilson, weaver, New Bedford, Mass.

The honorary members elected were: Frazer L. O'Leavy, Ware, Mass.; John McIntosh, Worcester, Mass.

There were various discussions pertaining to the manufacturing of woolen and worsted goods, between the American and the foreign operative, and the amount of work each was required to do. A sample of stock was presented for inspection for the carders and spinners to discuss, and information asked what run yarn could be made from it.

Alfred Cox of Mechanicsville, Conn., presented a patent spool head for card and jack spools, and explained its advantages.

Wm. Taylor also spoke upon a patented spool and an improvement which he invented. It will be placed on the market in the near future.

Mr. Jones of Philadelphia, spoke upon the merits of the vici tanned picker leather.

A motion was made and carried that any member of this association wishing a copy of the new manual should apply to the secretary, otherwise no copies will be sent out. A motion was made and carried that the constitution be revised, and that the president and the other officers be a committee to draft a revised constitution at the annual meeting to be held in November.

The following members were present: W. H. Hassett, Worcester, Mass.; J. W. Linnehan, Boston; Hiram Rathburn, Stafford, Ct.; C. L. Beckwith, Stafford Springs, Ct.; Walter Pickford, Leominster, Mass.; Alick Burke, Saxonville, Mass.; Jonathan Hartley, Chelmsford, Mass.; Jos. D. Price, Methuen, Mass.; J. J. Sheehan, Pittsfield, Mass.; John Hughes, N. Billerica, Mass.; Alfred Cox, Mechanicsville, Ct.; E. G. Tainton, Wamesit, Mass.; J. A. Jubb, Bennington, Vt.; Richard D. Twoling, E. Douglass, Mass.; P. T. Hamlin, E. Douglass, Mass.; Wm. E. Ahern, Worcester, Mass.; G. A. Parent, Moosup, Ct.; T. A. Parent, Moosup, Ct.; H. A. Tracy, Rochdale, Mass.; Samuel Tice, Lowell, Mass.; Wm. Batty, Philadelphia, Pa.; W. B. Sisum, Worcester, Mass.; J. J. Henderson, Cordaville, Mass.; Samuel H. Ilman, Worcester, Mass.; M. C. O'Brien, New Bedford, Mass.; T. J. Rigney, Auburn, N. Y.; John D. Meskell, Boston, Mass.; John Thornton, Glendale, R. I.; Wm. F. Supple, Claremont, N. H.; Archibald Ormisten, Waterville, Me.; David McTaggart, Worcester, Mass.; Thos. L. Holchen, Enfield, Vt.; W. V. Philbrick, Worcester, Mass.; Wm. Wilson, Lawrence, Mass.; P. L. McBride, Lowell, Mass.; G. W. Gerry, Maynard, Mass.; John McGill, Maynard, Mass.; Dick Snowdon, Lymansville, R. I.; L. H. Corey, Ludlow, Vt.; F. L. St. George, W. Medway, Mass.; Ira D. Martin, Woodbury, Ct.; C. A. Curtiss, Woodbury, Ct.; W. A. Moulton, Norwood, Mass.; Eugene Saxe, Boston, Mass.; Fred W. Dixon, Wellesley Hills, Mass.; J. H. Pickford, Leominster, Mass.; Louis M. Alhsin, Worcester, Mass.; Paul G. Wetstein, E. Dedham, Mass.; Eleazer Davis, Plymouth, Mass.; Frank A. Hardy, Plymouth, Mass.; Alexander Smith, Kenyon, R. I.; John Sheehan, New Bedford, Mass.; Wm. Taylor, Byfield, Mass.; Louis Cormack, Providence, R. I.; James B. Jones, Philadelphia, Pa.; John Wilkinson, Clinton, Mass.; C. M. Hurst, Providence, R. I.; S. Walker, Uxbridge, Mass.; Robert Russell, Uxbridge, Mass.; Craven Midgley, Lowell, Mass.; Jacob F. Get, Franklin, Mass.; Thos. J. Sullivan, Boston, Mass.; Frazer L. O'Leavy, Ware, Mass.; Geo. P. Leavy, Ludlow, Vt.; Wm. Kennedy, E. H. Boyce, Fall River, Mass.; A. Thoappleton, Thompsonville, Ct.

—Giving advice is the quicksand of friendship.—Mme. d'Epinoy.

—To glory in the deeds of our ancestors is to seek at the roots the fruit that can be found only on the branches.—Pichot.

The Hercules Cloth Testing Machine.

"The goods are coming out tender." No statement regarding his product carries greater consternation to the mind of the textile manufacturer than this. Goods may be too heavy or too light, off shade, rowy, streaky, cockly, filled with weaving imperfections, and have all other imperfections known to man except that of being tender, and yet remain merchantable. But if the fabric is tender, the goods are necessarily bad seconds; in fact they cannot be sold as seconds, but must be labeled tender and sold for a mere fraction of their cost.

To guard against the calamity of tender goods a manufacturer must subject his goods to constant tests, for this trouble arising from so many diverse causes, is apt to appear at the most unexpected moment.

To test goods for strength most manufacturers rely upon the hand test, which is most unreliable. No examiner has sufficient strength and endurance to test piece after piece for any considerable length of time; consequently, after a few trials, the most conscientious man lets the goods go without testing.

The standard for strength varies widely with different fabrics. What is strong for a light weight cassimere or dress goods would be tender for a Kersey overcoating, and no examiner has a judgment equal to the exact estimation of the strength required for each of the many cloths passing before him.

If more than one individual takes a hand at testing the strength, their opinions are certain to vary widely.

"That piece is as strong as a board and as tough as leather," exclaims a puny, pale faced fellow who has been pulling on the goods with might and main.

"Pshaw," shouts a strong, red faced, burly giant, as he pushes his thumbs through the cloth, apparently without an effort, "That cloth is as rotten as funk."

And who has not seen the superintendent or mill owner, when confronted with tender goods, taking a piece in his hands, screwing his face into horrible contortions as if he were straining his muscles to the utmost to break the goods, and then, when the cloth remained unbroken, stepping back with an air of injured innocence with the declaration that the cloth is all right?

The importance of testing textiles for strength and the impossibility of doing it properly by hand makes some mechanical means indispensable. Most of the machines heretofore offered for sale have been too expensive for general use. The one shown in the accompanying illustration, while accurate in operation, is offered to the trade at the moderate price of twenty-five dollars by Burke & Hanford, 621 Broadway, New York.

It is suited for all grades of textiles, and the drawing shows plainly the principle on which it works. The strain is applied to one inch of the goods and an indicator registers the strain at which the fabric breaks. The manufacturers invite correspondence and offer to send machines on approval to any part of the country.

A New Mechanical Leather.

Manufacturers will be interested in a new mechanical leather for which E. F. Houghton & Co., of Philadelphia, are sole selling agents. It is called Vici mechanical leather, and the agents claim some remarkable qualities for it.

There have been many attempts to replace leather in textile mills with canvas, rubber and other materials, and while many of these substitutes possess considerable merit and some of them have proved even better than leather for specific uses, it is a fact that none have driven leather entirely from our mills.

It is claimed that Vici leather is not a new or substitute material, but is a superior kind of leather, the same

grade of skins being used as in the manufacture of other various varieties of mechanical leather, the difference consisting in the process of tanning.

The prominent position taken by Vici kid in the leather trade is well known; previous to its introduction American shoes were for the most part made of calf or imported leather. Today, however, a very important part of the leather used, is Vici kid.

E. F. Houghton & Co., stated to one of our representatives that they were now prepared to supply Vici leather in all forms for use in the textile industries. They can supply the hardest and toughest possible roller covering for worsted rolls, the softest of oily picker leather, mill strappings of all kinds and hydraulic valves of all shapes. They state that with possibly the exception of some kinds of polishing leathers, they believe they can adapt the Vici leather to suit all mechanical requirements.

One of the chief arguments to support the claims made for the strength of Vici leather is the fact that special machinery is required for cutting it. It is so tough that the ordinary splitting and cutting knives will not touch it.

Although but recently brought to the attention of the trade, through the medium of advertising, Vici leather has been used in textile mills for over two years, and E. F. Houghton & Co., claim that Vici picker leather is now more generally used in America than all other makes combined.

The Jewell Belting Co., Hartford, Conn., one of the oldest and most reliable firms of tanners in America, have obtained the exclusive control of the tannage of Vici leather for manufacturing belts, and this fact is strong evidence as to the superiority of the product.

Further information can be obtained upon application to the agents, E. F. Houghton & Co., Philadelphia, Pa.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market.

Interested parties are referred to the manufacturers for further information. These items are published without charge and regardless of advertising consideration, the idea being to present to our readers a systematic monthly record of new machinery, etc. of interest to textile mill men.

We invite machine builders and others to send us such information for this department.

Chameleon Colors on Wool. Hannart Bros., dyers at Roubaix, France, have discovered a means of dyeing woolen cloth so that the colors change in appearance while under the eye of the observer. Owing to this peculiar property, these colors are called "Chameleon." They were first exhibited by Hannart Bros. at the Paris Exposition of 1900, and it is claimed the process, which is a secret, has been perfected so that it can be employed in dyeing a wide range of fabrics, such as broadcloth, thibets, zibelines, cheviots, homespuns, etc. A sample of broadcloth colored by this process can be seen at the Boston office of this journal.

Striping Attachment for Knitting Machines. The Babcock Machine Co., G. E. Babcock, proprietor, Fort Plain, N. Y., are putting on the market striping attachments for both latch and spring needle knitting machines. They are simple in construction and aim to suit all requirements. These stripers have been introduced into many representative mills.

Fibre Bobbins. Franklin E. Smith, 272 South Water St., New Bedford, Mass., is introducing to the textile

trade bobbins made of fibre, which are lighter than wood and said to possess other advantages; the surface is glazed to prevent the stock from sticking to it; it is claimed that this surface is unaffected by oil, no matter how long the bobbin may be subjected to its action.

Bleaching Machine for Cotton Knit Goods. The Rodney Hunt Machine Co., Orange, Mass., are offering to the trade an improved bleaching machine with squeeze rolls, for bleaching cotton knit goods with chloride of lime. The vat is made with an iron frame built for lining with Portland cement. It is furnished with adjustable brass springs, and is driven by a friction sprocket wheel, or flat belt pulley drive as desired. The machine is arranged for four to eight strings of cloth and has a capacity of from 400 to 600 pounds of goods.

The Heany Enclosed Arc Lamp. The American Electrical Mfg. Co., of Philadelphia, are putting on the market a new type of enclosed arc lamp, which is the invention of J. Allen Heany. The enclosed type of arc lamp has been found to be very well adapted for mill use, and this type is claimed to have desirable features, such as simplicity of mechanism, steadiness in burning, small size and light weight. The total weight of the lamp is less than five pounds, and it can be readily adjusted to run on any amperage. There are only two movable parts.

Dyeing Machine. The Rodney Hunt Machine Co., Orange, Mass., have recently placed on the market an improved piece dyeing machine adapted for woven or knit goods. It has a heavy iron frame with cypress lining. A curved back permits of an easy movement of the goods, and a slat partition gives a space for introducing dyestuffs. It can be driven by a chain sprocket or belt as desired.

Figured Knit Goods. The Excelsior Knitting Machine Mfg. Co., Allentown, Pa., are offering to the trade a knitting device for the production of figured knit goods, which is described and illustrated in the Knitting Department of this issue. An unlimited number of designs can be produced and more than one can readily by used for one stocking or other knitted garment. Owing to the popularity of fancy effects, this new device is likely to be extensively adopted.

Cotton Jacket for Rubber Hose. The Boston Belting Company, Boston, Mass., are prepared to apply to rubber a cotton jacket called the Universal; it is a heavy, seamless fabric, woven directly over the rubber hose. It greatly increases the strength of any hose to which it is applied, adds to its capacity to stand the wear and tear of being dragged about. The jacket is painted, which renders it waterproof, and the manufacturers claim that it does not kink, get bent or out of shape, or unwind when a strand is cut.

Yarn Reel. A firm in Switzerland is placing on the market a yarn reel, which it is claimed will indicate with quickness the number of the yarn by any of the various systems of yarn numbering now in use on the continent of Europe, including English cotton, French cotton, English worsted, English linen and the international or metric systems. The size of the yarn is indicated of ends of a certain length required to bring the pointer to a mark corresponding with the yarn numbering system in use.

Loom Reed. A Krefeld manufacturer has brought out a reed, invented by himself, and designed to produce moire or watered effects in the goods, by the raising and lowering of the reed in which the wire is bent so as to force the filling into the warp with varying degrees of intensity.

COTTON DEPARTMENT.

Imperfections in Weaving.

VI.

ARTHUR DYSON.

There are many kinds of cloth which, for various reasons, must have the picks matched; that is, whenever for any reason the filling breaks and the looms run for a pick or two beyond that point, the weaver must either run the loom without filling until the pattern is again at the place where the filling broke, or run the loom backward until the same place is found.

This operation naturally takes up considerable time, and in the case of designs where the pattern is a long one, and a weaver is expected to run 6 looms, the management have to allow considerable more per cut for the weaving price than they otherwise do, and in many instances have to reduce the number of looms per weaver to four.

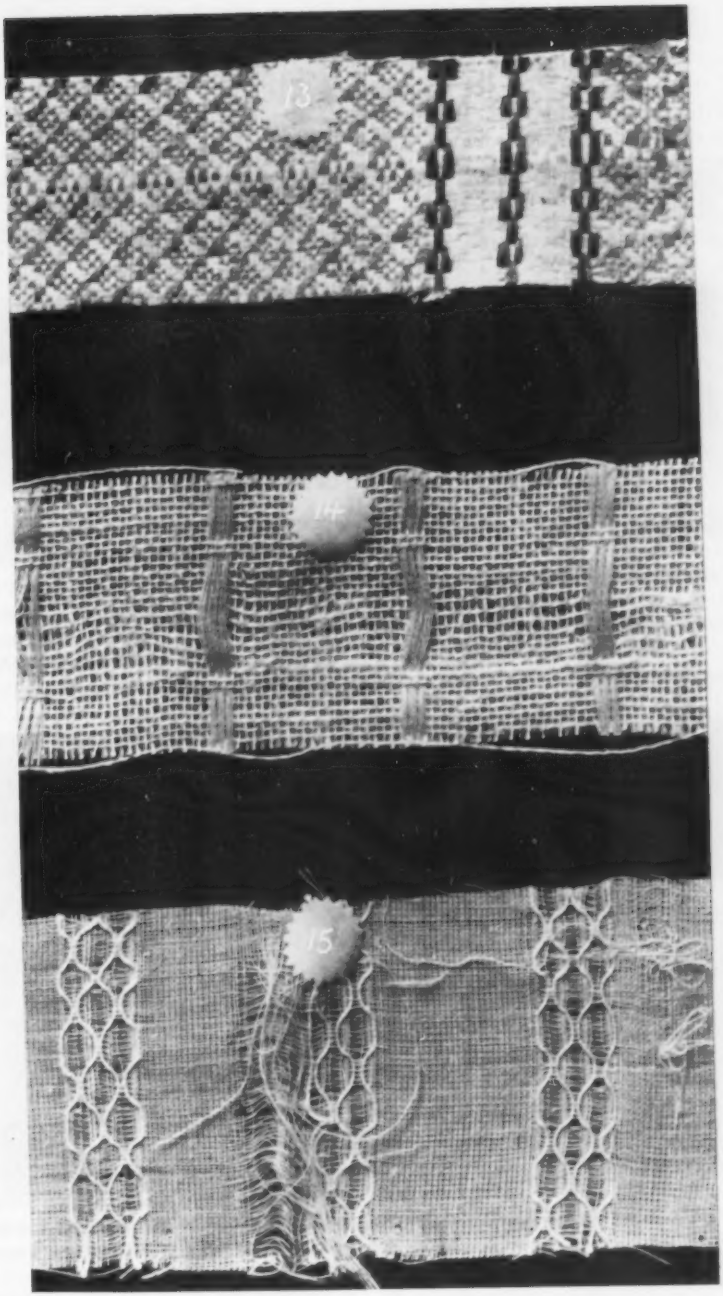
Even when this is done the imperfections creep into the goods, and many pieces of otherwise "good cloth" is passed as "imperfect" owing to the prevalence of such places as is shown in Figs. 13 and 14.

Many attempts have been made to overcome this defect, which has seriously hindered the weaving of other than "plain" goods. A "feeler," so-called, is often used, which, as its name indicates, feels the lessening of the filling on the bobbin, and by an automatic arrangement, changes the nearly exhausted bobbin or cop for a full one thus insuring the continuity of the pattern and reducing the weaver's work of finding the pick to the times when the filling "breaks" while the cop or bobbin is partly full.

This arrangement is a very good one and, in the opinion of the writer, should be applied to other than automatic looms; while other looms would be unable to replace the nearly empty shuttle, bobbin or cop with a full one, yet the loom could be stopped and, when the weaver was ready to start, the only thing to be done would be to exchange the empty for the full shuttle, thus saving an imperfection, and at the same time simplifying the work of the weaver.

The only serious objection to these mechanical feelers lies in waste of filling yarn; notwithstanding the item published in the May issue about a mill president who informed the new super that he had a good market for waste, and that this product must not decrease, the question of waste has to be considered very seriously; from statements made by other mill managers, the amount of waste made by the feeler is a great loss to a mill, and almost offsets any advantage derived from their use. Then, again, if the filling is wound on a bobbin, there is the expense incurred by having boys wind the pieces; they cannot be cut off without injuring the bobbin. These disadvantages have tended to discourage a general use of the mechanical feeler and direct attention to other expedients.

During a visit to the Boott Mills at Lowell, Mass., the writer saw an ingenious arrangement for the detection of nearly exhausted bobbins and one which it seemed was likely to eliminate the very defects which are complained of in relation to the mechanical feeler. With this device electricity was used for the detection of the fact that the bobbin was nearly empty; a brass ferule was placed on the shoulder of the bobbin, and two "plungers" protruding from the inside of the breastbeam on the loom. A slot was cut in the front of the


13
14
15

shuttle box, also one in the shuttle; when the lay is at its extreme forward position, these plungers strike against the yarn on the bobbin.

One of the plungers is connected with the live wire from the electric motor, while the other is grounded. Whenever the filling is so far used up that the plungers touch the brass ferule, the electric current crosses from one to the other, and thus operates a mechanism which stops the loom, or as in the case of the loom that I saw, a "Draper Corduroy" loom, changes the bobbin; when I inspected the bobbin I found not more than 6 yards of filling, and the gentleman who was with me assured me that, while the device in question had been in operation for several months, the amount of waste on one bobbin had never exceeded that amount.

I understand that one of the superintendents at the Boott Mills, R. Cowell, is associated with an expert electrician in the perfecting of this device, and they expect to have it patented.

At Fig. 15 is shown an imperfection caused by the fact that the warp ends have become tangled behind the lease rods; when the loom continued to take up the cloth, the yarn was stretched and eventually broken apart.

There are various causes and remedies for these snarls. In the first place, we will consider the snarl whose cause is found as far back as the warping room, but which really is charged up against the slasher-tender, owing to the fact that it is at that machine where the bad place is made. At Fig. 16 will be seen a number of warps ends that are stuck together, or, to use the more common expression, "taped-together." These ends were cut from 20s yarn and, as can be readily seen, it would be impossible to get them past the lease rod.

Unless warper-tenders are carefully watched, and strict orders given to them, they can generally be depended upon to do what will cause trouble elsewhere; one of these things is to neglect to properly tie together the two ends of a broken warp thread. Sometimes a "warper" will run several turns after an end breaks down (of course this should not be, but like other machines, the warping machine gets less attention than it ought to get), and when the tender looks for the end on the section-beam, it is nowhere to be seen.

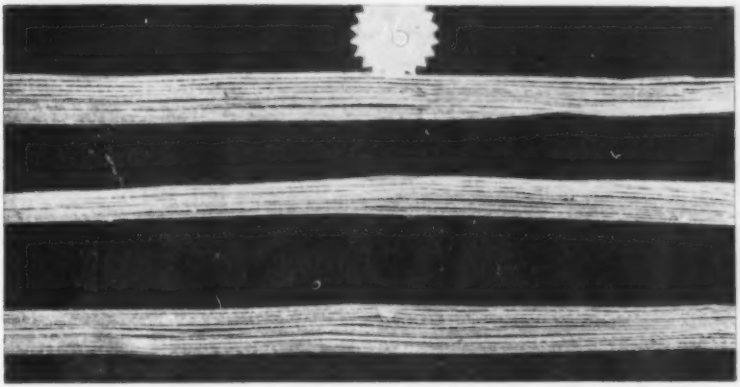
Instead of taking the proper means to find the end, they simply slip the other end among the unbroken warp threads, and start up the machine. When this place is reached by unwinding the bram at the slasher, the loose end will generally break a few more, and the result is what is termed a "tieback." When the slasher tender notices the broken ends on the section bram, he is obliged to twist them with another end, and then has several ends traveling together through the size box, over the cylinders and onto the loom bram, without being separated by the rods that are placed in front of the cylinders for that purpose.

To stop the machine before the loom bram is full will mean a hard place of size on the yarn; therefore there is but one of two things to be done, either to take off the loom bram with whatever yarn is on, or to take chances on the yarn not sticking together; it is thus a case of choosing the lesser evil.

The real remedy is to have a systematic inspection of all the warpers, to see that all the drop wires are free so that, as quickly as an end breaks, they will drop and stop the machine. Another excellent method is to have each slasher tender note on the back of the warper slip, the number of tiebacks found on each section-bram, and have them turned over to the superintendent of the mill every morning.

Another cause of the yarn getting tangled is that the yarn has been

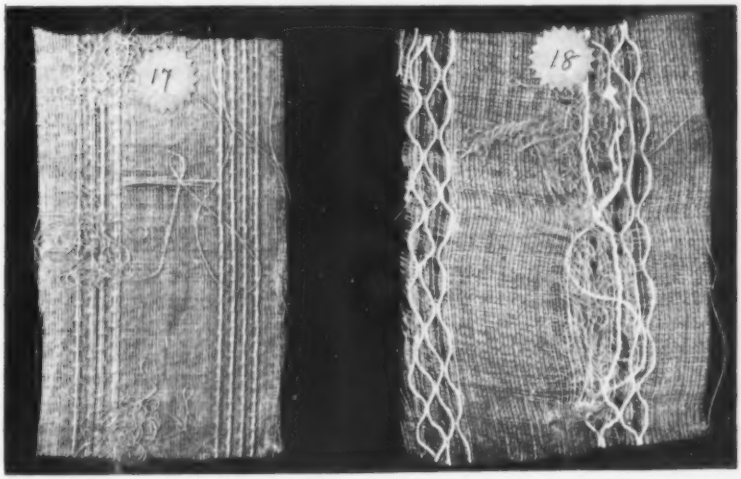
snapped while being wound on the bram; when the cloth is being woven the loose end will be drawn up faster than the others and either make an imperfection as shown at Fig 17, or by getting tangled up will make a



place like Fig. 15. The cause of these broken ends is found principally at the slasherhead, and is too much friction on the head or having the rolls wound too much with cloth, thus stretching the yarn to the breaking point.

In conclusion I would recommend that the weave-room overseer insist on the lease-comb being placed in the warp while the ends are still held in their proper position by the slasher; it is almost impossible to place a comb in the yarn after it has been cut from the machine; when the attempt is made there are generally some ends crossed over the others; especially in the case of fancy weaves, this state of affairs causes no end of annoyance and trouble to the weaver.

Many things can be adopted to reduce the trouble caused by ends being taped together, or being crossed over each other; such as placing a very large lease rod behind the regular lease rods, to be shaped like an oblong; on each end of this rod is attached a piece of flat iron long



enough to reach under the crank shaft; this is pressed down every time the crank moves toward the bottom centre, and resumes its normal condition as the crank reaches the end of its forward movement.

Another device is to attach a strap to the lay-cap and the regular back rod, with a spring from the rod to the whip-roll. This is generally used when but one side of the warp is crossed or stuck, and serves its purpose very well, the rod being pulled forward by the lay; as the lay goes back, the spring pulls back the rod.

Another method, which I have used when the warp was very badly crossed, is to have two whip-rolls placed on the loom, one about 3 inches farther out than the other, and have half the yarn pass over each roll. If the rolls are set right the yarn is separated where it leaves the bram, and the continual varying tension produced on the yarn by the opening and closing of the harness will open almost any warp; sometimes I have hung a rod between the two sheets of yarn and thus helped to obtain the desired result.

Double Weaving of Plain Velvets.

In velvet that is woven double the pile can be formed either by the warp or filling. When composed of the filling, it is cut after weaving, and this operation is, therefore, part of the finishing process. Velvet with a warp pile is, on the other hand, cut as it is woven. The warp pile is formed by inserting a rod in the shed, which raises the warp threads to the required height.

After the rod has been woven into the cloth, the pile is cut by passing a knife along the rod; this knife is guided by a groove in the rod. Sometimes the knife is attached to the end of the rod. When woven into the cloth, this rod is pulled out and the knife cuts the pile at the same time; an objection to this method is that it draws the pile in the direction in which the rod is drawn; it has been largely displaced in moquette looms by a system similar to that employed in hand weaving.

The weaving of two pieces of velvet at one time is similar to double cloth weaving. There is no advantage in weaving two fabrics of filling pile velvets at one time. The double system of weaving velvet is therefore confined to warp pile goods. They can be made with or without the use of rods.

Weaving two velvet fabrics with the rod, although a very old process, is not at present used to any great extent owing to the difficulties connected with the operation. Two foundation fabrics exactly alike are woven one above the other. As but one series of rods is used, the pile threads of the lower fabric must necessarily pass through the upper fabric. The pile of the lower fabric is, therefore, longer than that of the upper cloth.

Fig. 1 shows the chain draft for a single panne velvet fabric; the black squares represent the pile warp.

There are various kinds of panne velvet suitable for the different uses to which they are put. In some the pile stands erect, while in others it is pressed down. The pressing is done in the finishing process. All panne velvets with the exception of tufted velvet can be woven double. The last named variety with powdered tufts requires a very long and soft pile. It is formed by the curl of the wool before it reaches the spinning machine.

Fig. 2 is a cross section of the velvet woven as shown at Fig. 1. The pile warp is represented by the double lines; the foundation warp, by the dotted lines. Fig. 3 represents a cross section of the same fabric woven double. To make the illustration clearer the two fabrics are separated somewhat in the drawing; in practice they lie close together. The foundation threads are represented by the

dotted lines; the pile threads of fabric, A, by the double lines; those of fabric, B, by the heavy black lines. The filling threads, which are indicated by the black dots are woven one and one as numbered in Fig. 3; that is to say, one pick of the upper fabric is inserted for each pick of the lower fabric. Fig. 4 shows the chain draft for this order of weaving. If desired

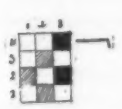


FIG. 1

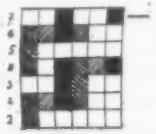


FIG. 4

FIG. 2

FIG. 3

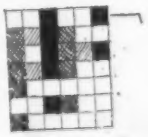


FIG. 5

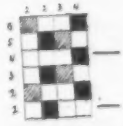


FIG. 6

two or more picks of one fabric can be woven in succession for an equal number of picks of the other fabric. The chain draft for this method of weaving is shown at Fig. 5, three picks for each fabric coming in succession.

The chain draft for the double weaving of velvet d'Utrecht is formed in the same way as for panne velvet. Fig. 6 is a draft for single velvet d'Utrecht; Fig. 7 is a cross section of the same fabric. In accordance with the preceding example, Fig. 8 shows the position of the pile threads in two such velvet fabrics woven together. Fig. 9 is a cross section of the foundation threads of the same fabric. A rod is inserted alternately for each cloth. The chain draft is shown at Fig. 10.

The order of the filling threads can be varied in weaving velvet d'Utrecht, as well as in panne velvet. For instance, a rod can be inserted twice in succession for each fabric. The chain draft for this method is shown at Fig. 11.

The double weaving of velvet with rods is adapted only for fabrics with a small number of threads per inch, that is to say, for the cheaper grade

FIG. 7

FIG. 8

of goods. By using two shuttles the two cloths can be kept separate; if but one shuttle is used, the two cloths are bound together at the selvages, and are cut apart by a knife fastened on the breast bean. In separating two velvet fabrics care must be taken not to displace the pile of the upper cloth.

Originally, velvet d'Utrecht was made with a foundation warp of linen and a mohair pile. At present, the foundation fabric is often made of cotton to reduce the cost. Three or even more velvet fabrics can be woven together; this method is open to serious objections and is, consequently, not used.

In the double weaving of velvet without the use of rods, the two foundation fabrics are placed one above the other, and the pile is formed by the warp threads passing from one fabric to the other. A special vibrating cutter is used for cutting the pile. The pile is apt to vary in length as

the knife does not cut the pile exactly in the centre. In addition to this, variations in the tension on the pile warp cause the changes in the distance between the two fabrics and a corresponding inequality in the length of the pile; to overcome these difficulties, loom builders have employed various warp let-off motions that are more or less efficient. The guide for the vibrating knife serves to keep the two fabrics apart.

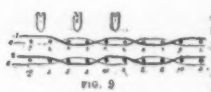


FIG. 9

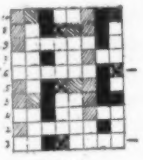


FIG. 11

FIG. 10

FIG. 12

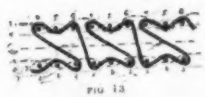


FIG. 13

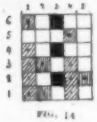


FIG. 14

FIG. 15

FIG. 16

All velvet weaves are not equally suited for double weaving, and generally the two fabrics woven together are alike as regards material and weave.

If it is desired to weave double the fabric shown at Fig. 2, a drawing, Fig. 12, of two such cloths lying face to face, is made. From this, another sketch is made, showing the pile threads of each fabric connected to form a continuous warp thread. Three picks of each fabric are inserted alternately until the cross section, Fig. 13, is completed. In the chain draft, shown at Fig. 14, the pile warp is represented by the black squares; the foundation threads of the upper fabric are represented by the squares shaded with oblique lines; those of the lower fabric, by the squares shaded with vertical lines. Fig. 15 is the same as Fig. 13, with the exception of the order in which the filling for each fabric is inserted. Fig. 16 shows the chain draft corresponding with Fig. 15. By examining Figs. 13 and 15, it will be seen that the pile threads vary in length owing to the difference in inclination when passing from one cloth to the other. Linen and jute pile fabrics for upholstery purposes are woven to a great width by the double system. These goods are substituted for the expensive grades of velvet d'Utrecht; cotton yarn is used for the foundation warp and filling.

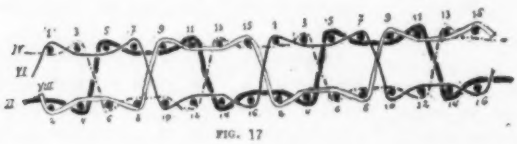


FIG. 17

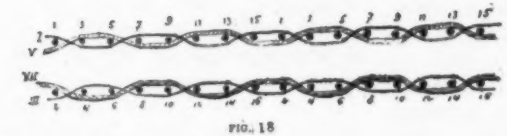


FIG. 18

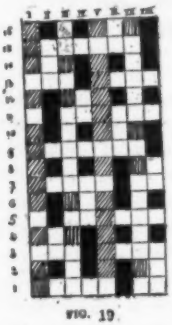


FIG. 19

Fig. 17 is a cross section of velvet d'Utrecht woven double, in which

four separate pile threads are used; Fig. 18 is a cross section of the foundation threads; Fig. 19 is the chain draft. When velvet d'Utrecht is woven double the lower fabric is inferior to that of the opper one.—L'Industrie Textile.

Japanese Cotton Mills.

Tetsutaro Inumaru, Tokio, Japan.

Read at the meeting of the New England Cotton Manufacturers' Association.

In the following statistics, 1 yen is the equivalent of 50 cents in United States money and 1 sen is one one-hundredth of a yen, or one-half a cent.

The following report is submitted of the cotton weaving in Japan for the month of September, 1901:

Number of looms, 3,733.

Operating days, 26 1/2.

Daily operating hours, 12 1/2.

Cotton cloth woven, 3,961,220 yards.

Cotton per day per loom, 42.93 yards.

Cotton yarn consumed, 996,452 pounds.

Cotton yarn wasted, 27,546 pounds.

Consumption of coal, 3,393,133 pounds.

Price of coal (per 6 tons), 23.78 yen.

Horse powers, 1,425.

Coal consumption, per horse power per hour, 4.99 pounds.

Laborers, man, 580.

Laborers, woman, 3,311.

Laborers' average wages, man, 34.99 sen.

Laborers' average wages, woman, 20.98 sen.

The following table gives the statistics of the various Japanese cotton mills for the last six months of 1900.

The following is given in explanation of the table:

Location. About 90 per cent. of Japanese mills are located between north latitude 34°-36° and east longitude 130°-140°.

The principal seat of this industry is the city of Osaka, next Okayama, third Nagoya.

System. About 30 years ago the Japanese Government imported cotton spinning machinery from England as models of this industry; consequently, most of the mills use English machinery.

All of the mill companies are organized as stock companies with the limited liability feature.

According to Japanese commercial law, the limited company is to be recognized as a legal body when the stockholders pay in one-fourth of the stock subscribed. So "Amount of capital paid in" means the amount which has actually been paid by stockholders; a limited company must set aside at least 5 per cent. of its profit as surplus. "Real estate, etc." means land, buildings, machinery, etc. The consent of the Government and the stockholders is required for the issue of bonds. The National Bank of Industry is organized for the benefit of industrial enterprises and lends money in yearly installments (term limit is 20 years) taking real estate as its security. "Loans from other banks, etc." means common loan with note, etc.; the company must settle its accounts once a year at least, and most of them do this twice a year at the last of June and December, and a certain amount of profit and loss is carried forward, generally, to the next half year. "Interest paid" is the interest paid for all loans. Almost all Japanese mills work both day and night. "Running expenses" is the expense from July 1st to Dec. 31st, 1900.

The settlements for the last half of the year 1900 show a loss for most of the mills. This is due to Chinese trouble in 1900 and also to financial condition in Japan.

—Authority that is despised is soon defied.—De Segur.

—They who have knowledge escape credulity.—A. Delpit.

WOOLEN DEPARTMENT.

Zibeline Dress Goods.

For the past two seasons, a ladies' dress fabric known as Zibeline, has been very popular in the European market and promises to retain this popularity for some time in the future. The distinguishing features of this cloth are a high lustre, a face finish and a mixture of a small percentage of white or bright colored mohair or other lustrous stock with a dark groundwork. The success of a Zibeline fabric depends in great measure upon the finish, although the raw material and lay out of the fabric must be right.

We have secured samples of the Zibeline goods in the various stages of manufacture, showing the goods from the loom, scoured, fulled, gigged, sheared, steamed and pressed. The samples possess a very high lustre, in spite of the fact that they are made of fairly coarse stock and have been exposed to the air for a considerable length of time, since they were finished. Manufacturers interested in this dress fabric can see the samples by calling at our office.

The Leipziger Monatschrift, in a recent issue, published an extended description of the process of finishing Zibeline, from which we extract the following salient points:

These goods are made in various grades of worsted, carded wool or shoddy yarn; the stock used for the light colored mixtures must be entirely different in nature from that of the groundwork to produce the desired mixed effect. As the cloth is used for ladies' goods, it must handle light and thin. It is difficult to loosen the fibres to obtain the soft handle without injuring such a light fabric, and there is danger during the fulling process of making the fabric too heavy and thick.

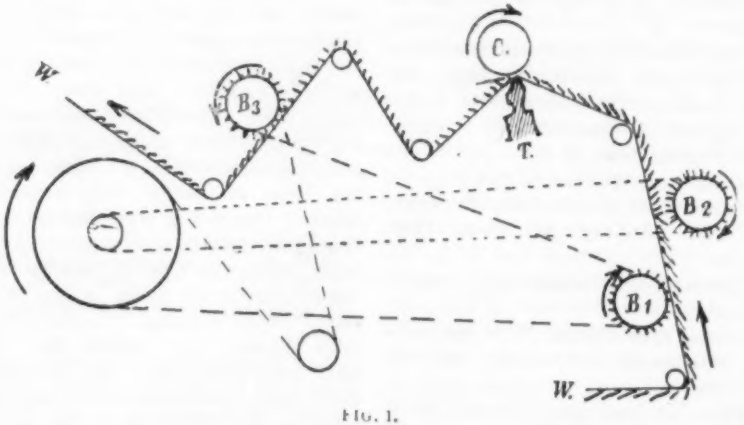


FIG. 1.

The cloth should be woven fairly wide on the loom, and both the width and length and lay out so calculated as to allow for a fairly large shrinkage in both directions. The fibres should be as long as possible.

The pieces are first scoured in an ordinary roll washer; the soap used should be as weak as possible; strong alkalies must be avoided; if extra means for cleaning the goods are required, ammonia is recommended. Alkali injures the lustrous, velvety

appearance and soft handle of the fabric.

After the goods have been washed and rinsed, first in warm and finally in cold water, they are extracted and dried on a tentering machine. Goods 50 in. wide and 39 yds. long from the loom, measure, after drying, about 2 per cent. less in width and length.

After drying, the pieces are ready for fulling. In some cases, the goods are fulled directly after washing and without previous drying, but better results are obtained by drying before fulling, as this method gives the finisher a better control over the last named operation. During the fulling process, the goods are overhauled every few minutes to be stretched out the width. It is claimed that this is very important for the production of the peculiar Zibeline finish, causing the fibres to stand erect on the face of the cloth.

The goods are shrunk about 14 per cent. in width and length. A piece 36 yds. long and 50 in. wide, measured after fulling 31 yds. in length and 42 in. in width. If it is not required that the finished fabric be non-shrinkable, this amount of shrinkage in fulling may be reduced.

After fulling, the goods are rinsed in warm and then in cold water, after which they are extracted; in case any folds or wrinkles are present, the pieces are crabbed. Zibeline cloth is gigged on a single up and down machine with very dull work. The use of sharp teasels is inadmissible. The slats should be set with three small teasels in a row to secure the best results. After the nap has been sufficiently raised, it is well laid with old slats while the goods are wet. The better the nap is laid, the better will be the lustre of the goods.

The pieces are then extracted and dried. During the latter process, the nap is well brushed. The temperature of the dry room should not be over 50 degrees C.

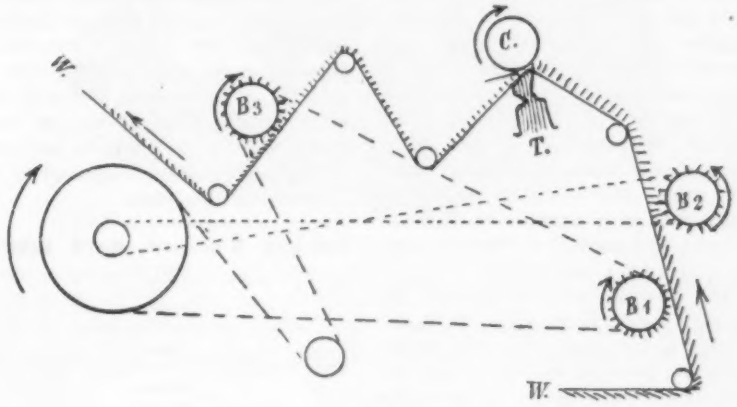


FIG. 2.

In shearing, the raising brush should be slowed down to one-quarter of the usual speed; the speed of the back brush need not be changed. At first the goods should run with the nap, which is raised by the front and laid by the back brush.

Figs. 1 and 2 show two methods of shearing, and the directions in which the brushes move. W is the cloth; B1, back brush; B2, front raising brush; B3, laying brush; C, cylinder; F, shear rest. The arrows indicate the directions of movement of the different rolls.

Fig. 1 represents the goods running with the nap; Fig. 2, against nap. The goods are given four runs with

the nap, as shown at Fig. 1, and then two or more runs are given with the nap as shown at Fig. 2. During this process the blade is gradually let down to give the desired finish.

Frequent changes may be avoided by having two shears, or by first running a large quantity of the goods as shown at Fig. 1, and then changing the machine and shearing them as shown at Fig. 2.

After shearing, the goods are pressed and steamed. To set the nap, the pieces are first run through a rotary press with the face down and next to the bed, head end first, and at a fairly high pressure. Steam is applied and the nap laid by a brush as the goods enter the press. It is a good plan to press the pieces twice in this manner. The goods are then wound on perforated copper rolls, covered with a few thicknesses of cotton cloth. Steam is then applied to these rolls at a pressure of 12 to 15 pounds, and allowed to blow through the goods for a few minutes.

The cloth is left on these rolls for several hours, after which it is unwound and pressed in a plate press. This last pressing should be done under light pressure and at a moderate temperature, the time being extended as required.

Goods properly constructed and finished as above, will possess a high lustre and fine face, and the nap will not rough up by sponging or wear. The fabric will handle firm yet soft without being too thick or heavy.

Textiles in Massachusetts.

The wages paid to the 149,346 textile workers in Massachusetts amounted to $53,946,858 in 1900, or $361 for each one. This yearly wage was 5 per cent. more than in 1890, and stands out in strong contrast with the wages in the textile industries of other states which generally show a decrease for 1900, as compared with 1890. In Pennsylvania, for instance, the 1900 textile wage rate was $320, as compared with $341 for 1890, a decrease of over 6 per cent. These figures confirm the general impression that labor conditions are more favorable for the textile workers in New England than in other parts of the country.

Some branches of the textile trade in Massachusetts show a decrease during this decade, both in the total number of hands employed and the total value of the product. This is the case with the woolen industry, in which a decrease of 9 per cent. in the number of employees took place; the worsted industry, however, more than made up for the difference, by an increase of nearly 60 per cent., showing plainly the strong drift of fashion toward worsted fabrics. The cotton industry shows an increase of over 22 per cent. in the number of hands, and stands at the head of the list with 92,515 workers or nearly 60 per cent. of the total number employed in all branches in this state.

Finishing Wool and Mixed Fabrics.

XIV.

BY N. REISER.

Translated from the German for the Textile World.

Continued from May

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During the gigging the teasel becomes filled with flocks, and after a time, owing to the presence of these flocks, their gigging power is lessened. The slats are then reversed in order to bring the clean side of the teasels into use. This is what is called "one half side" of work; when the other side is also filled with flocks, the goods are said to have had "a full side" of work. Some fabrics require as many as seven "full sides." Old teasels are used at first and as the nap is raised on the face, sharper work is introduced.

In order to expedite this process, which with a single gig requires considerable time, machines have been built with two cylinders, arranged to

give as many as eight contacts of the cloth with each cylinder during one passage.

Fig. 43 shows a double gig, in which the cylinders can be revolved in the

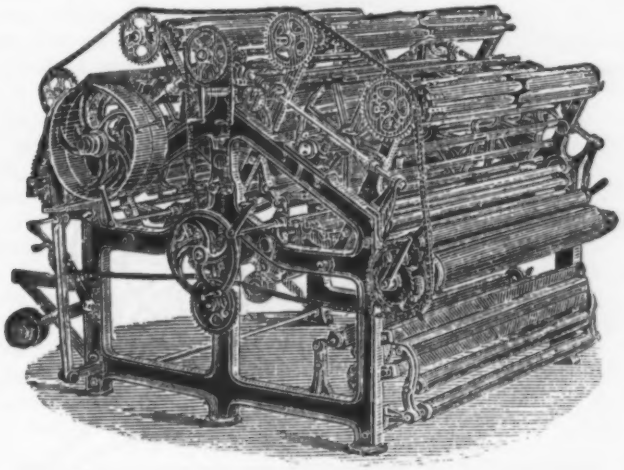


FIG. 43.

same or different directions as desired; that is to say, one can be run with and the other against the nap at one time. An adjustable device enables the pressure of the cloth on the cylinder to be regulated, and, if desired, one of the cylinders can be thrown entirely out of action.

In roll gigging each teasel is mounted separately upon a pivot, and revolves during the process. The teasels are placed diagonally on the cylinder so that the points do not operate on the cloth with full force. This method is used for goods in which it is desired to raise a very little nap on the surface, such as moltons, flannels and the backs of other fabrics.

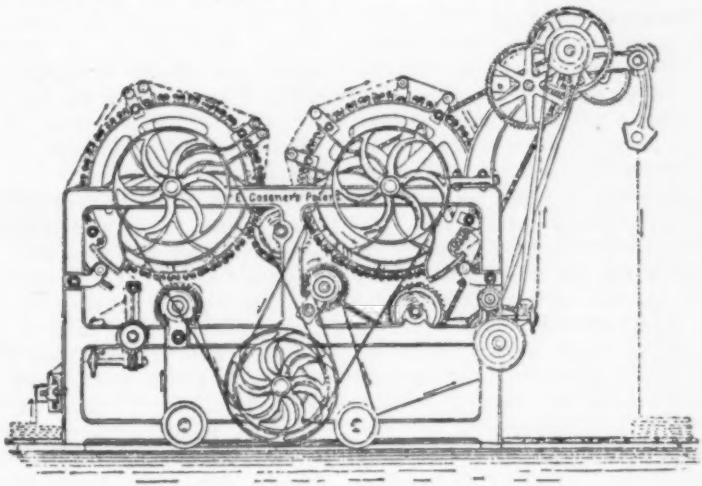


FIG. 44.

Fig. 44 shows a roll gig adapted for as many as four contacts of the cloth

with the cylinder, and has given good results.

Fig. 45 shows a machine for gigging goods in the wet state to secure a high

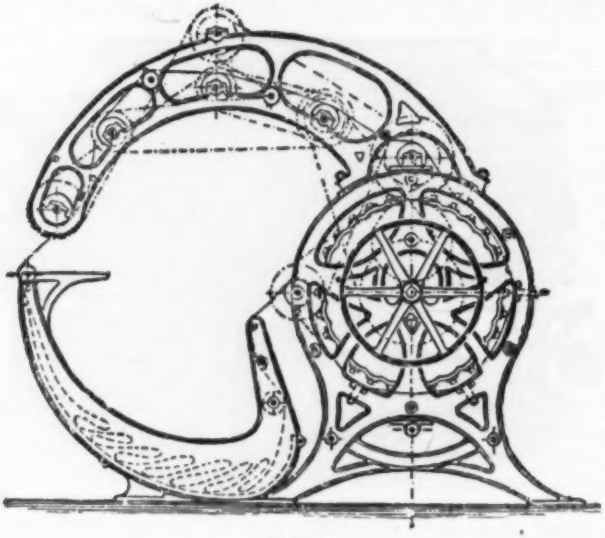


FIG. 45.

lustre. The special feature is the trough filled with water, in which the cloth lies before and after each passage through the machine.

The object of gigging woolen fabrics is to comb out the fibres, which have been more or less felted in washing and fulling, and to lay them parallel and pointing in one direction. Many kinds of half wool and all cotton cloths are, however, gigged or napped simply to loosen the fibres and soften the face of the cloth.

The pieces are piled regularly in front of the gig, if a single up and down machine, and sometimes several are sewn together. To each end of the strings short leaders about one and a half yards long are fastened. These leaders are fastened at each end to iron or copper rods, to which in turn straps are attached; the other ends of these straps are fastened on the drums of the machine. The above method is employed with single gigs; on double gigs the pieces are sewed end to end without using the leaders.

Running the pieces over the gig once from end to end is called a "half run;" running once in each direction is called a "run." A side consists in from four to six "runs." If the goods receive one side of work and then the slats are reversed and another side of work is given with the back of the slats, this is called a "full side."

In finishing face goods with single gig, it is essential to reverse the pieces. When the nap is sufficiently raised, the gigging is completed by laying the nap while the goods are saturated with water. For close finished goods this reversing of the pieces is not necessary.

The cloth should be kept uniformly moist during the gigging process, in order to soften the wool fibres and also the teasels. If it is desired to clear the "bottom" of the fabric well, it is advisable not to have the cloth too wet, since otherwise, the teasels become too soft to do the work properly.

Gigging should be begun with dull teasels. An exception to this rule is found in the case of certain overcoating fabrics, but for face goods the gigging is begun with dull teasels which are gradually exchanged for sharper work. At first, the cloth should be applied lightly to the cylinder, and gradually brought down harder as the

process advances. The heavier the felt, the more slowly and carefully should the goods be gigged.

After the pieces have been given six to eight runs, according to the requirements, the machine is stopped, the tension on the cloth relieved and the slats reversed, when the machine is again started, and the work continued with these unused sides of the slats. In case a "full side" of work is not sufficient, other and sharper slats are introduced, and the process continued until the felt is thoroughly loosened, after which the process is completed, as already observed, by gigging in one direction, while the goods are quite wet.

If the cloth is to be gigged on both sides, the back should be treated first, so as not to disturb the nap on the face during the process. For kerseys, beavers, doeskins and similar fabrics, the "bottom" need not be thoroughly cleared out, since a thick nap is the object sought for in these goods.

On the other hand, for closely sheared worsted effects, and for goods where it is necessary to have the weave or fancy yarn show plainly, the "bottom" must be well cleared in gigging.

During the gigging, the operator should examine the cloth frequently, to follow the progress of the work, and should test the fabric for elasticity and strength, in order that the goods may not be injured by gigging. Care should be taken to prevent the forming of wrinkles. These are apt to occur even with the best spread rolls.

To examine the "bottom" of the fabric the cloth is doubled between the thumb and forefinger, or the nap is brushed sharply backwards; the operator can then see if the felt has been broken up or the "bottom" cleared out enough.

The moisture in the goods during gigging is a very important point. If the pieces are too dry, an excessive amount of waste in the form of flocks is made and at the same time the "bottom" is not well cleared; if too wet, the face of the goods is apt to have a scaly appearance.

If the moisture in the goods is irregularly distributed, the gigging will be correspondingly irregular, and this defect can often be discovered by the teasels becoming irregularly filled with flocks. If the teasels fill up rapidly with flocks, this is an indication that the felt has become well broken up and that the goods are about ready for the finishing run. White goods, or those dyed with fast colors are often wound on rolls after gigging, and left for one or two days for the nap to set.

When the gigging is completed, another set is sewed on the machine, while the first set is coming off; this is to avoid the laborious threading of the pieces between the different rolls.

If the gigging is not completed at the close of the day's work, the pieces should be taken from the gig, as otherwise they are apt to become spotted with rust or oil during the night. On the rotary teasel gig and on many single gigs where the pieces make continuous runs, the ends are fastened with brass needles in place of being sewed. Mill sewing machines have, to a great extent, displaced these methods of joining the ends of pieces on the gig.

Many of the single and double gigs are provided with brushes for cleaning the teasels during the process of gigging, but these cannot be used on the finishing run, or when the goods are very wet.

The filling up of the teasels with flocks depends in great measure on the quality of the goods. Fine fabrics with a short nap will, as a matter of course, fill the teasels more slowly with flocks than fabrics made of long wool. Sometimes new teasels are soaked in hot water to soften the points. If this is not sufficient, a straight edge is sometimes lightly held against the teasels, as they are carried

round by the cylinder; this should be done very carefully, as it is liable to injure the points.

Another expedient for softening the teasels is to fill them with gig flocks, which, of course, must be of the same color as the goods to be gigged. The teasels are sometimes taken from the old slats, soaked in hot water, and then reset, so as to expose the unused side.

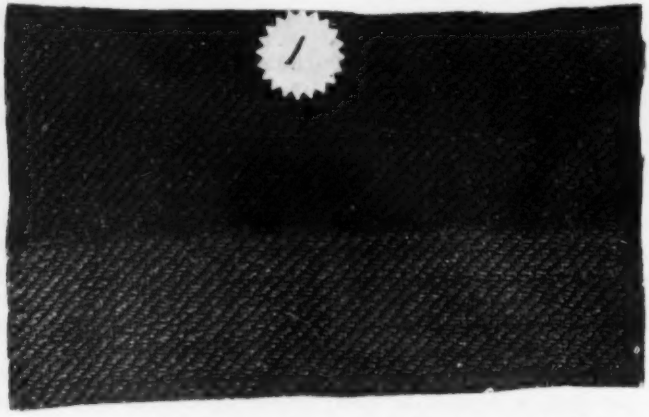
When finishing certain kinds of goods having a very heavy nap, it is frequently necessary to crop the nap during the gigging, after which the process is completed. This cropping, by removing a portion of the heavy nap helps the teasel points to reach the "bottom" of the fabric.

(To be Continued.)

Imperfections in Woolens and Worsteds.

LEWM.

Fig. 1 illustrates a defect made in the weave room which, particularly in the case of fancy woolen and worsted



fabrics for men's wear, cannot be remedied in subsequent processes without completely changing the appearance of the fabric.

The defect noted has been caused by inserting a bobbin of filling of the wrong shade or color.

A defect of this kind will necessitate changing a fancy stripe or check into a solid colored fabric before a salable article is produced. This method of making piece-dyes is not economical. The results are not always satisfactory either, for it is not always possible to more than modify the defect, especially if there is much difference between the right and the wrong shade of filling.

All weave rooms are not lighted as well as they might be, some requiring artificial light all day long. In these places it is very hard to tell the difference between some shades, say black and navy blue, although they show up quite plainly in the piece when the latter is being drawn over the perch.

The defect shown is not always caused by inserting two separate colors of filling in what is intended to be a stripe pattern; sometimes filling that is supposed to be of the right shade is found to be so different from the original shade that it produces a barry effect across the cloth when woven next to the original in the same piece.

One lot of yarn should be used up before another lot is started. A "lot" here means all the yarn of a certain shade that has been dyed at one time. Dyers have not yet learned how to make each succeeding batch of a certain shade exactly like the original.

Stripe patterns are generally woven with one shade of filling only, and the insertion of a bobbin of filling that is

off-shade shows more clearly in a stripe than it does in a check because there are other colors in the latter to modify it.

On account of the possibility of some of the bobbins of filling being off shade, some mills run two bobbins of filling at once, picking one or two picks from each successively; this tends to equalize or modify any inequality of shade that there may be between the filling on the two bobbins.

In men's wear check patterns containing several shades of filling it is not uncommon to find two or more colors that are so near the same shade that it is very hard to distinguish between them in an artificial light. When weaving such patterns great care should be taken to avoid mistakes like that illustrated.

A good method to adopt is to have the tops of the bobbins painted for about half an inch and run colors that are hard to distinguish on bobbins of contrasting colors. For example, a black yarn might be wound on a red tipped bobbin, and a dark blue yarn on a light green bobbin, in case black and dark blue were required for the same piece.

In such a case a weaver can readily distinguish between the two colors of bobbins and need not be straining his eyes trying to distinguish the different shades.

When a certain shade of filling is to be run for a long time it is advisable that it be run on the same color of bobbin as long as it is used, so that a weaver will learn to associate a certain color of filling with a certain color of bobbin.

—Misery is everywhere, but so also is happiness.—Voltaire.

—To hide a fault with a lie is to replace a spot with a hole.—Petit-Senn.

—To recognize one's own ignorance is a fine exhibition of judgment.—Charron.

Picking and Carding.

III.

BY SAM DRIVER.

(Continued from May.)

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I told Bob to have his men shake up every armful of stock and layer it after it had gone through the picker for the first time. The men were doing this while the bur picker was running, as this machine was fed with a self feed. The pickers all had the automatic feed, which I think is as good as one picking.

I nearly always take out every other tooth in a wool picker, leaving a tooth opposite the place where one was taken from the adjoining bar. On a Fearnaught wool picker I would on some batches take out some workers or set them off. The staple of the wool can easily be broken by too much picking, and it is the staple that is essential in making good yarn. Good stock is often ruined in the picking room.

My success in carding, and it is generally conceded that I have been very successful, has been in trying, from the picker to the spinning room, to save the staple of what little wool has been in the batches I have used.

The last place I carded any really good all wool batches, such as Australian, Ohio, Montevideo or other fine wools, was with the Norfolk and New Brunswick Hosiery Co.; and it is so long ago that I have almost forgotten how to pick and card such material.

I have carded in only one woolen mill for the last twenty-five years where genuine all wool batches were made up, all the others using either shoddy, cotton, goat hair, camel hair, kangeroo hair, silk noils, ramie, mohair, or some other animal, vegetable or mineral substances mixed with genuine sheep's wool.

Pete, the second hand, and George, the grinder, had dusted and brushed out all the cylinders, doffers, workers

and strippers, cleared the gum out of the fancies, and had all the feed rollers, lickers, tumblers, all the workers and strippers bearings cleared out. Each of the ring doffers was strickled a half hour with the emery board and plenty of oil, then brushed with a good hand card filled repeatedly with wool and vibrated across the rings for half an hour on each doffer. This clears all the old gum out and takes off the wiry edge. The stock will never run back on the rings if time and patience are used in brushing; if

—I have carded in but one woolen mill for the last twenty-five years where genuine all wool batches were made up, all the others using either shoddy, cotton, goat hair, kangaroo hair, silk noils, ramie, mohair, or some other animal or vegetable substances mixed with genuine sheep's wool.—Sam Driver.

half an hour is not enough, give them one hour.

If the ends run back on the doffers every time they are stripped, that card will make more or less twitty roving.

I looked the card through from the first breaker to the finisher, and did not find it very much out of the way. I set the strippers down some perhaps; they had not been set down for years, and were a way off from the cylinders.

The workers, strippers and doffer I set with a 28 gauge, which I had become used to in setting tight or slack. By using this gauge, I am pretty sure not to get too close. What is the use in grinding if you set too close to begin with and loosen your point? You might as well never grind.

The best carding is not always done by the closest and finest setting. Have the cards set as close as they will run without striking in any place; find the highest sheets on the cylinders and the highest places on the doffers and do the setting by these, especially on ring doffers. Cylinders, doffers and workers are not always true.

We now had the lot started on the finisher, and it started up fine. The boss spinner came along and said,

"Sam, this card always made twitty roving. What makes twitty roving? Most every card in the room is making twitty roving."

"Well," I replied, "I will tell you a few things that cause twits. Roving drawn too quickly from the doffers will cause twits, remedy draw slower: one tooth too slow from the doffers will make small tufts in the roving. If the fancy belt is slack or if the fancy is not set on the cylinder hard enough or set too hard, it will cause twits. The best and truest way to set a fancy is by gauge. Then you get both sides just alike.

Carders that set by ear, try your gauges on every fancy in your rooms, and you will find that on most of them both sides are not alike.

If the rings are rough and dull they will make twits; the remedy is to keep them sharp and smooth. If the ends run back after stripping the ring doffers, they will cause twits; remedy, have the wiry edge taken off by vibrating a hand card filled with wool briskly over each doffer for two hours or more. Rings are very often neglected. They ought to be kept smooth and in the best shape. Many carders pay but little attention to their ring doffers; they need to fear God and gain wisdom.

(To be continued.)

KNITTING DEPARTMENT

The Knit Goods Situation.

The underwear market during the past few weeks has continued dull and lifeless, but not any more so than is always to be expected at this season of the year.

Weather conditions during May continued to be unfavorable for the sale of light weight underwear at the hands of the jobber, and the advance business for fall has been practically completed. Deliveries on summer weight goods still continue to be a source of trouble and dissatisfaction to the jobber, but manufacturers profess their inability to remedy this state of affairs and state that they are doing everything in their power to hurry forward deliveries.

On fall goods the market is in extremely satisfactory shape and all lines of desirable goods are well sold up. Prices on men's fleeces have advanced considerably and in many instances offers which, a few weeks ago would have been gladly accepted are turned down by the selling agent. This condition of affairs comes as a surprise to those merchants who have persistently held back from placing their orders, in the expectation of getting better prices as the season advanced, proves that "delays are dangerous."

Balbriggans of every description for spot delivery have been in excellent demand and are being inquired for by buyers on all sides, but stocks are insufficient to supply the demand.

Some lines for the spring season of 1903 are already in the market but are not openly offered, and are shown only upon request.

Some of the agents representing prominent lines already report considerable business booked at prices practically the same as last season with a few advances in exceptional cases.

The hosiery situation is also very satisfactory, and business for fall has been practically completed; a large amount of business on lace hose for spring season of 1903 has already been booked. Late deliveries on lace goods this season, have been the means of bringing about early requests from buyers to see new lines of samples in order to insure early deliveries for next season, and already some of the best manufacturers are practically through with their early business and will accept no more orders on lace hose for delivery earlier than June-July, 1903.

Some very handsome designs have been produced by the leading makers which compare favorably with foreign goods that land at about the same price. We refer particularly to full-fashioned, full-lace hose at $3.25 and $3.30, which compete with the M 8.70 goods landing in currency at about $3.31.

Prices on fleeced hosiery for fall have stiffened considerably and few concessions are being made to buyers.

Reports from Chemnitz indicate great activity in that market. Mills are being run to their utmost capacity trying to fill back orders and prices for the coming season have advanced considerably. Buyers are careful not to cancel their back orders no matter how late delivery may be, as they know full well that they cannot cover themselves elsewhere except at an advance.

The greatest activity is noted among manufacturers of ladies' lace hose and men's half-hose and, notwithstanding the fact that many of the manufacturers have greatly increased their production by the addition of new machines, the demand cannot be supplied and goods which were due last January will not be shipped before June or July. Deliveries next season will, undoubtedly, be as far or farther

behind than has been the case this season and it is even doubtful if all the goods now sold will be made in time for delivery during the season.

In some of the lower priced goods manufacturers are using a cheaper grade of lisle thereby avoiding having to advance their prices. Embroidered goods are also looked upon with favor for spring and many of the buyers for American houses who have recently visited the Chemnitz market have placed liberal orders on this class of goods. The prices will be considerably higher owing to the fact that the cost of embroidering is fully 50 per cent. higher than last season. Not so much attention is being paid to fancy striped hosiery although some of the larger houses have placed liberal orders whereas other buyers have passed them by altogether.

Finishing Woolen Hosiery.

Woolen hosiery should be first scoured by the dyer, before coloring, so that all of the grease may be removed, for if any grease remains in the fabric it will show itself sooner or later after the goods are finished, and will soil bands and boxes, and hurt the sale of the goods.

After being colored, the goods should be carried immediately to the board room, and not allowed to remain in the baskets two or three days, as often happens when the finisher does not look well after them.

After reaching the board or dry room, they should be immediately drawn on to the boards to shape them, and in doing so the boarders should see to it that they are carefully drawn to the board, so that every part of the stocking may fit the form perfectly. If this care is not exercised, the goods will be apt to be baggy at the toe, and the heel will be uneven; if rib hose, great care must be taken to have the ribs boarded straight, or they will look badly.

After being boarded and dried in the hot dryer, they should be taken from the boards, and if they are plain hose, should be pressed either between the press papers, or in a steam press. A steam press gives the best finish as a general thing. After coming from the first boards, and before pressing, they should be placed in a steam box for a few moments until they are dampened a little, then pressed lightly in the steam press; this will give them a fine glossy look, but great care must be taken not to press them too much; if you do, it will give them a glazed or shiny look.

Some finishers press the goods when they first come from the hot box, and then steam and repress them, but as a general thing pressing once is sufficient to make them look well. If they should be ribbed hose, the press should be adjusted so that the feet should only receive the weight of the press, and the whole length of the leg of the stocking should not be allowed to come under the press, the leg lying free from pressure, while the foot is being pressed. The dampness in the fabric coming from the steam box, will cause the ribs to swell as they receive the heat from the press, while the foot is being pressed, and will bring them up so they will look plump and bright.

The operator will soon learn by the looks of the goods how long to let them remain in the press. All stock will not press alike, and no certain time can be fixed upon to leave the goods in the press. Good judgment must be used, and the goods removed as soon as pressed enough to be bright and glossy and the rib well brought up.

After the goods have been thus operated on, they should be taken to the finishing room, and there kept free from dust and flying lint, by being carefully covered by a white cloth until such time as they are given to the finish menders to mend. Great care and good judgment is required to mend neatly, sort and mate the toes and heels, and lengths of the legs to a nicety. Unless the heels and toes

are well mated, and the legs are also of the same length in pairs, the goods are not well finished, and the mill will be the loser.

Under no circumstances should badly mended goods go as first quality, only one length should be in the same bundle. The goods should be put up in dozen, or if nice goods, in half dozen boxes, with a neat band around the first two pairs on the top of the box. The cases should be so made that the boxes will pack snug in the case, for if they shake while in transportation, the boxes will be apt to break.

Figured Knit Goods.

The three samples of figured hosiery shown at Fig. 4 were made on an ordinary circular knitting machine by an attachment invented and patented by Emil A. Hirner, the president of the Excelsior Knitting Machine Mfg. Co., Allentown, Pa., and which is offered to the trade by this company.

The figured effects are made with courses knit with different kinds of threads, producing horizontal stripes combined with the production of a longitudinal projection of the stripes at certain points. By the various combinations an almost infinite number of effects may be produced.

The invention applies generally to knit fabrics of any sort and to figured effects produced by the use of threads differing in material, quality, thickness, or color; but for the purposes of description it will be convenient to explain its application to the manufacture of hosiery knit from threads of different colors.

FIG. 1.

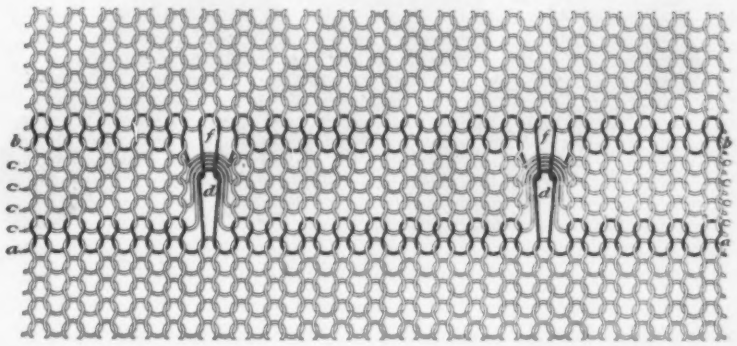


FIG. 2.

In the accompanying drawings, Fig. 1 illustrates a stocking the leg portion of which has been knit according to this new method, so as to embody a number of different designs. Fig. 2 is a view of a fabric knit from threads of two colors, enlarged sufficiently to show the arrangement of the loops by which the figured effect is produced; Fig. 3 is a similar view showing a different arrangement of the threads of the intermediate courses.

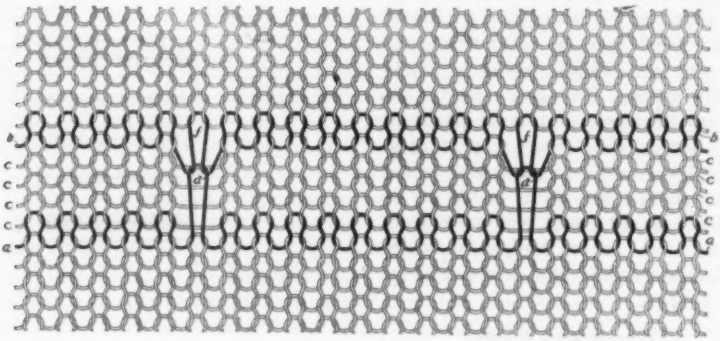


FIG. 3.

Fig. 2 shows a fabric all except two of the horizontal courses of which are knit with white threads. Two courses a and b are knit with black thread. Between these two black courses are four white courses, c c c c.

FIG. 4.

If the entire piece of fabric had been plain knitting, it would exhibit nothing but two black horizontal stripes on a white ground. Instead of this at two points, loops d d, belonging to course a, have been drawn forward, so as to project longitudinally ahead of their fellow loops of the same course and into the territory of the succeeding white courses, c c. Furthermore, the interknit loops, f f, of the course, b, by which this forward projection of the loops, d d, is effected, are themselves drawn back behind their fellow loops by the tension of the loops, d d, so that there is produced along the same longitudinal series of loops a forward projection of the black stripe, a, and a backward projection of the black stripe, b, and by the meeting of these two projections the effect produced to the eye is that of a longitudinal line or stripe joining the two horizontal stripes.

The fabric may be made upon any ordinary circular-knitting machine. In Fig. 2 the projected loops, d d, are ten stitches apart. To effect this, every tenth needle of the machine must be so operated that after receiving the loops of the black course, a, it shall be prevented from knitting during the knitting of the four succeeding courses, c c c c.

This may be accomplished by preventing these needles during the knitting of these four courses from raising far enough to throw the loops of the black course below their latches and returning them into line with the rest of the needles at a point either above or below the feeding-level.

The fabric shown at Fig. 2, has been made by throwing the loops in at a point above the feeding-level. Consequently the threads, c c c c, of the four succeeding courses have all been laid in the hooks of the inactive needles without being interknit with each other. When the work has progressed as far as the course, b, these needles are again thrown into ordinary action and having taken within their hooks the loops, f f, from thread, b, when drawn down by the knitting-cams shed simultaneously loops, d d, and the four white threads over their backs, thus interlooping all five threads with the loops, f f.

Thereafter these needles continue to knit, as do their fellows, and plain knitting is produced until it is desired to again reproduce the pattern, when the operation repeats itself. If instead of throwing these needles in at a point above the feeding-level they had been thrown in at a point below the feeding-level, the action and resulting fabric would have been the same, except that threads, c c c c, would not have been taken within the hooks of these needles, and consequently instead of being interlooped with loops, f f, these four threads would pass across straight behind loops, f f and b b. The resulting fabric is shown in Fig. 3.

Trade With Cuba. The cotton goods imported into Cuba last year, 1901, were valued at $6,109,044. Of this amount but 8 per cent. came from the United States, while 53 per cent. came from Great Britain, 10 per cent. from France and 4 per cent. from Germany. It is a matter for congratulation that we distanced at least one of our three great competitors in the race for business in cottons with the new republic. The hard fact remains, however, that of every dollar's worth of textiles brought into Cuba the United States furnishes but eight cents' worth. The small share we have in the textile trade of Cuba and the Philippines, amounting in the latter case to less than 1 per cent., should not continue. To secure this trade, these markets must be studied. Reciprocity may aid us, but reciprocity helps those most who help themselves.

—He who confides in a babbler and lends to a spendthrift, finds his secret everywhere and his money nowhere. —Petit-Senn.

SILK DEPARTMENT.

Observations upon Silk Sizes.

JULES PERSOZ.

The sizes of silk vary widely with the place of origin; in general, the finest have the greatest value. The following table will give an idea of the limits within which the sizes of several grades of silk fluctuate:—

Raw Silk	9 to 30 deniers
Organzine	18 to 34 deniers
Tram	24 to 64 deniers
Wild Silk	98 to 285 deniers

These limits are not fixed, but are frequently passed in each direction. The processes of winding silk have been so perfected, that in some cases it is possible to get uniform raw silk of 6 to 7 deniers, and organzine 12 deniers, but such results are exceptional.

The mulberry silk cocoon filament reels about 2 1/4 deniers, consequently the number of deniers in the grege is a little more than double the number of cocoon filaments. For example, if four or five cocoons are reeled together, a grege of 9 to 11 deniers will be obtained.

It is practically impossible to secure perfect regularity in the sizes of silk throughout the different parts of the skein, and for this reason the variations are more likely to be greater if the samples are taken from different parts of the bale of silk. These irregularities arise from various causes, the chief one being the inherent difficulties of the reeling operation, while inexperienced and careless operatives combine to greatly increase the variations. Sometimes, to make up for the filaments that have been left out during the reeling, the operatives will add extra cocoons, thus making the grege heavier than it should be. Then again, they may neglect to add the cocoons at the right time, and thus the grege will be finer than is required. If the silk reeled by such careless operatives is put with that reeled by skilful and careful hands, wide variations will be found in the size of the samples taken from different parts of the bale.

Very often the managers of silk filatures have the silk reeled by each operative distinguished by a separate number, and thus are able to trace bad work to the one responsible for it. No matter how skilful a reeler may be, it is impossible to secure such uniform results in this process, which depends upon the attention and the natural skill of the operative, as can be obtained in the purely mechanical operation by which cotton, woolen, worsted and linen yarns are produced.

Owing to this variation in the size of silk, a reeling from a bale of silk cannot be taken as proof of the size of the silk in that bale, but is merely an indication of the size. A better idea of the average size can be obtained by taking the average of several tests from different parts of the bale or from different parts of the same skein.

Owing to the unavoidable irregularities in silk, it is usual to make in commercial transactions an allowance of one or two deniers. For example, grege will be sold as 10 to 12 deniers; organzine 18 to 20 deniers; that is to say, the silk is said to reel within the limits indicated. The irregularity of silk enhances its value to a considerable extent, and for certain fabrics it is essential that the variations should be confined within narrow limits.

From the foregoing, it will be seen what an advantage it is to make test of the size of the silk from several skeins taken haphazard from the bale, and to increase the number of tests, while employing short lengths for

each one. By reeling separately 20 skeins of 500 meters each, as is done in the large conditioning houses, a much better idea of the average size of the lot is secured, than if ten tests of 1,000 meters each were made, although the total length of the silk selected for the tests would be the same in each case.

It is important to bear in mind at the outset that raw silk which has gained its weight by conditioning, loses a portion of its value in the operation, for as we have already said, the value of silk is in proportion to its fineness, and any increase of weight reduces the value per pound by reason of its increase of the indicated size of the silk.

This reduction of the value by increasing the weight by conditioning is somewhat of a guarantee against the practice of unduly weighting the silk and in any event, it acts as a compensation even when the practice is followed, since a portion of the gain represented by the increase of weight is lost by the decrease in the value per pound. This fact also shows plainly that the operations of conditioning and reeling are, to a certain extent, inseparable, and combined with the tests for determining the boiling off, which will be mentioned later, they give the buyer extra information in regard to the merchandise in question.

Since the variations of moisture in silk introduces an element of uncertainty in the results of reeling and weighting, it is important that some means should be taken to obviate this cause of error. To this end, the official conditioning houses of Paris and Lyons have for years certified to what is called the conditioned size. The skeins having been reeled and weighed, at first together, then separately, are next dried in ovens. A certain percentage of moisture regulated by law and equal to 12 parts of water for each 100 parts of dry silk is then added. The size of the silk thus treated is called its conditioned size.

This practice is not so essential as would appear at first, as long practice has shown that, except in certain extreme cases, where the silk is coarse or hard twisted, it is not necessary to employ it, since fine silk reeled in an atmosphere of a normal degree of temperature and moisture is quickly brought to the same condition as the surrounding air as regards humidity. This explains why the Paris and Lyons conditioning houses do not employ special means to give yarn that is to be reeled the degree of moisture required. When such means are employed, it is at the request of the party interested. With very coarse or hard twisted silk this equilibrium of moisture is not restored during the process of reeling, and in such cases, the special means above referred to are employed to determine the conditioned size, and for which a small fee is charged.

THE BOILED OFF SIZE.

Boiling off by removing a portion of the weight of the silk reduces at the same time the size. Under ordinary circumstances, this loss is practically uniform for products of the same nature and texture, and the extent of this loss can be estimated with a fair degree of accuracy.

This, however, is not the case when the silk contains, in addition to the normal quantity of foreign matter, a charge that has been added for the purpose of fraud. In the latter case, the manufacturer suffers loss, and a high degree of uncertainty is introduced into his calculations. Suppose, for instance, that he has manufactured a fabric of a certain degree of firmness and solidity and has neglected to determine how much of the silk used in the goods was lost in the boiling off. If a second lot of silk used in the same class of goods contains an extra charge of foreign matter and, consequently, loses more in proportion, the goods will come out inferior to the previous lot and pos-

sibly cause a serious loss of money and reputation to the manufacturer.

To determine the boiled off size of silk, recourse has been made to three different methods: 1. Reeling a certain number of bundles, which have been boiled off; 2. Reeling the raw silk and then boiling off these reelings, which are again weighed after being thoroughly dried; 3. Reeling the raw silk and calculating the boiled off size from the loss determined by testing a separate sample in boiling off.

The Silk Industry in the United States.

The statistics of the silk industry given in the advanced sheets of the 1900 census tell a story of rapid growth during the preceding decade.

The invested capital increased from $51,000,000 to $81,000,000, or nearly 60 per cent. The value of the finished product was $87,000,000 in 1890, and $107,000,000 in 1900, an increase of nearly 23 per cent.

The wages amounted to $18,000,000 in 1890, and $21,000,000 in 1900, an increase of nearly 17 per cent.

This pleasing story of expansion is, unfortunately, not continued when we examine the rate of wages per operative.

Forty-nine thousand, three hundred and eighty-two wage earners were employed in this industry in 1890, and this number had been swelled to 65,416 in 1900, of which 37 per cent. were men, 16 years of age and over, the balance women and children.

Of the men, the average daily wage in 1890 was $1.77. This is decreased to $1.47 per day in 1900, a loss of 17 per cent.

Of the women, the daily wage in 1890 averaged 92 cents; in 1900, 90 cents; a loss of 2 per cent.

Of the children, the daily wage in 1890 averaged 52 cents; in 1900, 47 cents; a loss of 10 per cent.

The work of these operatives converted raw silk into a more valuable finished product, which in 1890 averaged daily $5.46 per operative; and in 1900, $5.89. The value of the raw material per operative consumed daily was in 1890, $3.44; in 1900, $3.18.

The trend during this decade toward cheaper goods is shown by the increase of but 23 per cent. in the value of the product, while the increase in the quantity of raw material consumed, which affords a fair basis for judging the increase in the quantity of the finished product, amounted to over 52 per cent.

Another change worthy of note is the practical disappearance of hand looms, of which in 1880 there were 3153, in 1890, 1747, and in 1900 but 173. The power looms during the same time increased from 5321 in 1880 to 20,822 in 1890 and to 44,257 in 1900.

Silk Gloves.

A paper read at the recent meeting of the Silk Association of America, by Mr. Julius Kayser, New York.

The increase in the manufacture and sale of silk gloves for the past year has been very decided.

The industry is comparatively new in this country. Starting in 1887 with a production of less than 2000 dozens it has grown to an output of over 180,000 the past year, consuming about 80,000 pounds raw silk, and giving employment to over 2000 operatives. The production in value, in round figures was $1,000,000.

The class of goods produced is of a very high order, and has entirely superceded the inferior article formerly imported.

In addition to silk gloves, the manufacture of wool gloves has become an important article in the knitting trade, and has assumed large dimensions during the past two years. These gloves are made principally in the Western States, and at a low estimate 300,000 dozens will be produced in this country this year, requiring about 325,000 pounds of worsted yarn.

The value of the output may be estimated at $1,250,000.

POWER DEPARTMENT

Lubricating Oils.

BY J. F. LIEBERMAN.

Read before the Warp and Weft Club of the Philadelphia Textile School.

(Continued from April).

The fourth essential, durability, signifies the evaporation test and refers only to hydro carbon oils; when a light bodied oil is required, this quantity should be fully tested. Some hydro carbon oils lose nothing when exposed for 8 hours at 200 deg., while others lose 25 per cent. No oil should be used which loses more than 3 to 4 per cent. An oil with flash point below 340 deg. will evaporate considerably.

The freezing point is not so important when oil is not to be exposed to a low temperature. In American and English hydro-carbon oils, a poor cold test shows excess of paraffin, which is detected by cloudy appearance of oil at low temperature.

The last point to be noticed is the price, but in oils price has really little connection, as many users of oil think they procure best quality of oil for their purposes by paying a high price; this is where the oil buyer is fooled, as the oil agent, knowing the oil is worth considerably less and is being sold elsewhere for the same purpose at a lower price, is afraid to lose the sale by the purchaser condemning the oil on account of its being low priced.

Taking price of sperm oil as standard, at 100 per cent., we find that the price of marine oils are from 44 to 55 per cent.; olive oils from 60 to 70 per cent.; animal oils from 66 to 100 per cent.; seed oils 44 per cent.; hydrocarbon 7 to 30 per cent., which latter price is value of American 925 deg. oil.

The oils purchased by the trade for lubrication are: Southern sperm oil, Arctic sperm oil, olive oil, known as Gallipoli oil, lard oil, animal or tallow oil, neatsfoot oil, castor oil, mineral hydro-carbon oils.

There are mixtures of these pure oils, such as spindle oil, loom oil, machinery oil and shafting oil.

Southern sperm oil, when pure and unadulterated, is an excellent lubricant, especially for rapid running machinery. It has specific gravity of .875 to .884 at 15.5 deg. C., and does not become gummy. It is high priced, so it is often adulterated with mineral or fish oils. It is obtained from blubber or head cavity of the sperm whale. Lard oil is prepared by cold pressing lard and is limpid and colorless, contains acid and gums considerably. It has a specific gravity of .915 at 15.5 deg., and it is frequently adulterated with cottonseed, neutral mineral, cocoanut olein. It possesses a poor cold test.

Castor oil is from seeds of the plant. It is very viscid, of about .96 specific gravity, and is largely used for heavy machinery. It is substituted by "blown oils," and has great tendency to gum and form acid. This oil will not mix well with petroleum or mineral oils.

Mineral hydro-carbon oils are divided into three general classes: (1) Scotch mineral oils, which are distilled from coal; (2) American petroleum oils; (3) Russian petroleum oils.

Scotch, mineral oil, if pure, has little viscosity, half that of sperm oil; possesses a low flash point and has a strong petroleum odor; it evaporates very rapidly. These defects are remedied by loading it with a compound named Viscom, the composition of which the manufacturers refuse to divulge.

The American oils are pure and well refined and well suited for lubrication. They have a safe flash point.

350 to 450 deg., and are free from spontaneous combustion; they are entirely free from acid and have no tendency to gum, so that they allow the bearing to run free, thus saving fuel and give satisfactory results when wear and tear is thought much of.

Russian oils have high viscosity at 60 deg. F., but at higher heat they are not as good as American, hydro-carbon oils. They are superior to American oils for use in cold countries. Cottonseed oil is quite unfit for a lubricating oil as it is very gummy. Sperm oil is often adulterated with mineral hydro-carbon oils (bloomless variety) arctic sperm, whale oil, seal oil, cod oil, shark oil, aniseed oil and lard oil.

The mineral hydro-carbon oil adulterants are: Thickened cottonseed oil, resin oils, Viscom, silicate of soda. The addition of mineral hydro-carbon oil to fish, seed, or animal oils lowers the flash point of the original oil.

The flash points of oils are: Sperm, 520 to 530 deg. F.; olive, 590 to 595 deg. F.; animal lard, 575 to 590 deg. F.; animal neatsfoot, 525 to 535 deg. F.; mineral American, H. C., 345 to 350 deg. F.

Mineral hydro-carbon oils resist saponification when attacked by an alkali, as caustic potash. The odor from the oil when heated may tell much as to the adulterants used.

Now just a word as to trade names of a few common oils: The lighter lubricating oils are called "spindle oils" and are used on rapid running bearings.

"Machinery oils" form the middle grades, and "cylinder oils" are the heaviest. The best cylinder oil is the mineral hydro-carbon cylinder oil, as this produces no acid action on plates, bolts, etc., of the cylinders: Never purchase a mixed cylinder oil as it very often contains all sorts of rubbish and costs more than their real value. The quantity of oil for lubrication of a steam engine depends on: Boiler pressure, speed of piston (in feet), condition and arrangement of valves, character and size of cylinder and piston, method of applying oil.

Practical experience is best test for cylinder oil, but to test for filtered oil, place a drop on filter paper and see if any sediment remains after oil has been absorbed by the paper. Poor cylinder oil is detected by placing some on the back of the hand and rub well with finger of the other hand; if it smells of paraffin, it shows the presence of excess of volatile oils which should have been removed in process of refining.

Among the humbugs in oil trade such names may be noticed as: Double refined olive oil, oil guaranteed free from acid; stainless oils; oils with fancy names and lubricating greases guaranteed to save 80 per cent. are of the same order. A stainless oil should be easily removed from fabrics by washing. The use of grease for lubricating purposes produces more friction than a mineral oil.

Heat has great effect on oils. This can be seen by starting a mill Monday morning, when bearings and oil have cooled since Saturday; when grease is used this evil is intensified, as it is harder to melt the grease. In lubrication of bearing of top rollers of spinning machinery, grease is best to use, as oil would spoil the leather covering these rollers.

Does any one ever consider the many points which arise in the lubrication of any one machine, for instance: (1) How to properly lubricate the self-acting mule? (2) How to properly lubricate the power loom?

In a mule there are seven classes of bearings, each to be considered separately: Spindle bolster, spindle footstep, fluted roller bearing, top roller ends, saddles, tin roller bearings, head stock and carrier pulleys.

Now as to the peculiarities of the bearings:

	Load.	Speed.
Spindles,	Very light,	Very fast,
Fluted Rolls,	Very heavy,	Ordinary speed,
Top Rolls,	Very little,	Ordinary speed,
Front Saddles,	Very heavy,	Ordinary speed,
Tin Rollers,	Ordinary,	Fast,
Headstock,	Ordinary,	Ordinary to fast.

Thus we see three kinds of lubricants are needed: 1, for spindles; 2, for headstock; 3, tin rollers.

The satisfactory lubrication of a power loom possesses more difficulties than in case of a mule; for instance, in a loom we have: (1) The bearings in which a shaft revolves; (2) The bearings on which a wheel revolves; (3) Bearings in which shaft revolves, but which are subjected to a great number of shocks during each minute the loom is at work; (4) Bearings when the moving part simply oscillates forward and backward; (5) Bearings of oscillating motion; (6) Bearings when moving part has very slight motion, but is subjected to great pressure; (7) The shuttle spindle.

Few manufacturers, however, care to take the trouble to change their present system of using one oil for all bearings, and very few think of the fuel and expense saved by choosing the right oil for a particular bearing.

In finishing I would call attention to the fact that the general trend of this paper has demonstrated fact after fact in favor of mineral hydro-carbon oils being superior to others for lubricating purposes, and, owing to the ever-increasing use of these oils and the constant discovery of new and improved methods of distillation, there seems to be no doubt of the mineral hydro-carbon oils being the lubricant of the immediate future.

—Modesty is like the shadow that accentuates the light; it is the chastity of merit, the virginity of noble minds. —de Girardin.

—Cartwright christened his first power loom Big Ben, after a celebrated prize fighter of that period, the action of the machine suggesting the movements of a pugilist.

Mill Castings.

In regard to castings for general use in a factory, repair shop or even in a machine shop, for building new machinery, I think there can be one opinion, and it is this, always insist on having them made from new pig iron of a soft quality. Very hard castings are not fit to make supplies such as are wanted for looms, cards, spinning or other machinery in textile mills.

I always insisted upon buying from a foundry that furnished good, sound, soft castings. Of course, the first cost would be more per lb., but the cost of working and fitting up hard, cheap iron was far more than the cost of good iron and then, when ready for use, the cheaper castings would not wear or last half as long as those made from soft castings. Often have I had the arms of loom gears break off, and that would cause the face to be out of true and make them noisy. When a gear broke in that way, I always found that the casting was hard, as if made from old iron that had been melted over several times. At one time we used shuttle boxes made of cast iron. They had to be of the best of iron, but were rather heavier than were the malleable iron boxes made for 2 or 4 shuttles. I should never recommend cast iron for shuttle boxes.

I have made and used shuttle boxes made of wrought iron such as we called nail plate; it came in strips about 2 1/4 inches wide by 1/8 inch thick, and made a light and good box, but it was more work to fit them for use than it was to finish those made from malleable iron. Then the loom builders got to making looms with malleable iron shuttle boxes, and I have not seen them since with either cast or wrought iron ones.

In the old No. 2 mill of the Harris Woolen Mills in Woonsocket, R. I., the power was furnished by a large breast water wheel with segment gears bolted on the outside rim of the

wheel and connecting with a pretty small jack gear with a rather short jack shaft connecting with an upright; this brought a heavy strain on the bearing of the jack shaft, which was of cast iron; being so near the water, the bearing was kept pretty wet, and the strain was so heavy that about every month the box used to cut or wear so badly that it would have to be replaced. There was no babbit metal in use at that time; we had to have a new box ready all the time. My father, to try and overcome the trouble, made and drilled the lower half full of 3/8 inch holes, then drove copper rods into the holes; when all filled and smoothed up, the box was put in place. That box did not wear out for a number of years. That satisfied me that the hardest metal was not the best for machine bearings.

At the time I first worked for the Woonsocket Furnace Co.'s machine shops, a party was having a lot of cotton cards built. They insisted that the bearings for the cylinder should be made as hard as possible. Well, they were hard, for they were cast on steel chills. In a very short time both the bearings and shaft were all ground out. The next lot of cards were fitted up with cylinder boxes made of good new iron and then annealed, and there was no trouble with them.

Any one can be convinced of the difference between brittle and soft iron by looking at the cook stoves and ranges made by the Barstow Stove Co., Providence, R. I., and then at the stoves made by some firms where the castings are made from old, hard iron. The Barstow stove is always smooth and the iron soft and, during my fifty years of housekeeping, I never had one break or crack, while I have seen others that were made of poorer stock that would crack within a few months.

The fingers that rested on the pattern chain to operate the side jacks of the Greenhalge loom were malleable iron, a few were made of composition, but malleable I think is the most suitable. Composition for steam valves should not be too hard; a medium soft is best for bearings.

At one time every one wanted the cam rolls to be made hard, so we had them cast in chills, which made the face of the rolls very hard; this was supposed to add to their durability. They soon discovered that the picking shoes were being worn out very fast; then nothing would suit but to make chills for the packing shoes; then it was thought they would go all right and last a long time. It was much more work to fit these shoes, drilling and tapping for set screws, fitting them to the picking shaft and drilling for the studs on which they revolved. Soon it was discovered that the rolls wore out where they ran on the stud fully as quick as did those made of common iron. Then, the face where the rolls struck the shoe would wear on one side, and thus become uneven; this was caused by the hard face of the roll breaking through and that would cause an uneven throw of the shuttle. One time the roll would strike the shoe on its full side and next it might be on the worn side. It was soon found that both the cam roll and shoe had to be replaced oftener than when made of ordinary soft castings. So the chill business in that mill was gradually done away with.

A new loom fixer came to work once and every one was telling what a good fixer the new man was. Before he had been there a month he had gained a new name; he was called a loom smasher. He never fixed anything. If a piece of a loom went bad and needed a little repairing, his way was to take a hammer and break it into pieces beyond repair, and then come to the supply room for a new part. We had a room in which spare supplies were kept on hand for all the moveable parts of the machinery of the mill. This loom smasher when putting in a new warp.

would want a new set of harness jacks and levers, and often every one of them would be renewed before the warp was woven out. Finally, I told the agent if he kept that loom smasher, I must have an extra hand in the shop.

Loom fixers make a big difference in the list of repairs. We had some fixers that did not use up one dollar's worth of new supplies in the time that the smasher would break up twenty dollars' worth. I never knew what became of him. I think the only tool he wanted was a 3 or 4 lb. hammer.

Before I ever saw or even heard of babbit metal, while working with my father on repairs, if any of the large bearings got worn, we would bore them about 1/4 inch in larger than the shaft, and then line them with sheet copper; they would last longer than a new cast iron box would. This taught me at the start of mechanical life that hard metals are not the best for bearings. Then people began using brass, then later on composition, but from what I remember it was generally made too hard. Iron or composition that is too hard or full of blowholes makes a very poor bearing for any kind of machinery.

Babbit metal came into use later, and was a decided improvement over cast iron or composition in almost all cases. If fairly good oil is used they give very little trouble, but I am speaking of the pure babbit not the kind some use, which looks as if made of old lead junk. Such metal is good for nothing, and will give you all the trouble you want.

EBEN GOULD.

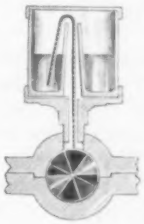
—Who knows not how to be silent knows not how to execute.—de Girardin.

—Practice is to theory what the feet are to the head. The feet I have known never invented anything, not even the shoes.—de Girardin.

The Finch Oil Cup.

The accompanying sectional drawing of the Finch oil cup shows clearly the construction and operation of this simple device for lubricating bearings. The oil is carried through the cup to the shaft by means of a conducting wire, the lower end of which rests upon the shaft, while the upper end is immersed in the oil. It is claimed that with this oiler, only enough oil is supplied to the bearings to maintain a perfect film. When the journal is stopped, the feed stops automatically.

This cup will handle any engine or machine oil except castor, lard or



other organic oils carrying large percentages of free acids, as the latter will eventually corrode the feed wires. The better the oil, the better the opportunity for the cup; as only the necessary quantity is supplied, the highest grade lubricants can be used with thorough economy. The feed is easily regulated so that there is no dripping or waste of the oil, and, consequently, no stained goods, no ruined belts or dirty floors.

The Finch cup has been used for a number of years on both high and low speed bearings of all descriptions, and the manufacturers, the New York Lubricating Oil Co., 35 Water Street, New York City, refer to many users of the device to substantiate the claims for it.

An additional advantage it possesses is that no grit or dirt can enter the bearings through the cup, and no attention is required, except to replenish the oil when necessary. The cups are made in various sizes.

Further information can be obtained from the manufacturers.

The Electric Drive for Cotton Mills.

W. B. Smith Whaley, Columbia, S. C.

[Read at the meeting of the New England Cotton Manufacturer's Association.]

The advocates both for and against this method of operating textile factories have brought forth, with considerable freedom in their various articles, the assumed advantages and disadvantages. The ability to investigate any power plant designed and operated especially on the lines projected for the best installation of this class of work has never before been presented.

The writer has been repeatedly called upon for his views in regard to the working of these plants, and could only give cursory data from the handling of a plant that was operated electrically, but was unable to point to the causes, otherwise than prospective, of the economies exhibited. We now have the good fortune to have installed and in operation so many of these plants that the speculative features can be measured with very little doubt.

New mills have been designed in the last six years with the most modern appliances, deriving their power from steam engines and distributing it by means of electricity. The distribution of the power for the purpose of operating the plant can be measured from the generating source, and the connecting link, the electric drive, can be definitely compared with the other methods of operating such plants by means of ropes or belts.

A few years ago I installed a plant driven by ropes and belts and also one driven by electricity. It had been the practice previously to adopt electricity in places where the convenience of the method was concerned rather than its possible economy. This gradually developed into its adoption as a sole means of driving, because it was more convenient on account of the location of the plant in the development of water power, to distribute the power electrically, rather than from the fact that it was possible to place it in any plant in competition with the older methods of driving.

In a range of mills from 600-horse power to one of 6000-horse power that have been installed in the last three years, there has been a development of features and advantages directly comparable with the older methods.

A few years ago I presented before the American Society of Mechanical Engineers a paper on the relative advantages of the electric and rope driven mills. In one case the power was measured from the indicator cards to the work produced; in the other it was measured at the receiving switchboard which distributes to the mill the power purchased from an outside source. The relative value of these two methods of operating a mill was 26 per cent. friction in the rope driven mill, against 17 per cent. of friction shown in the electric driven mill, from the switchboard to the work produced. The connecting link from switchboard to the cylinders was still to be determined.

In designing the Olympia Cotton Mills of Columbia, S. C., the established custom in regard to the method of operating cotton mills was disregarded. The power plant was designed without any regard to the mill except that the generators supplied the current the same as the outside sources furnished it to the mill, to which allusion has already been made.

The operation of this plant under these conditions for six months has enabled us to obtain figures and data that I believe more than justify the adoption of this method of operating a cotton mill, as the results have been most favorable. The different departments have been carefully and regularly measured and the missing data from the switchboard to the cylinders has also been obtained and proven to be most satisfactory. The relative figures in this plant show that the

combined losses from the cylinder to the work produced in the mill are much less than by the older methods of operation.

Comparative figures would be as follows: Rope driven mill, 26; electric driven mill, 15. There appears to be a clear gain of eleven points in favor of the electric driven mill; measured in value of friction there is a net saving to the mill of 42.3 per cent. of its friction. In other words, the efficiency of the motive power in producing work is increased from 74 per cent. to 85 1/2 per cent. These losses are going on all the time and amount to a considerable figure.

A saving of this difference in any institution would mean a net dividend on its capital stock. It is safe to say that in many of the older mills the friction load varies all the way from 50 per cent. down, and the adoption of the electrical transmission in these plants would unquestionably remunerate the company far more than the revamping of almost any other part of the plant.

The system adapts itself readily to older designs of mills and can be installed at no prohibitive cost. The resultant economies would more than pay for the change in a very few years. The fact that the speeds are extremely uniform has been more than proved in actual practice, and the production of plants using this method of operating is increased four to five per cent. in the same number of hours run.

These with other economies result in a very satisfactory gain over any other known method of operating factories, and it must be only a question of time when the older plants must change their driving mechanism in order to avail themselves of the greater economies which are today unquestionably demonstrated for the electric transmission.

The installation as compared with the rope or belt drive for mills exceeding 25,000 spindles is unquestionably as economical, if not more so, and in the Olympia it has proven itself much cheaper. The decreased cost of that installation is unquestionably many thousand dollars. The shafting and belting are one of the largest items of saving and have been cut in two, or even reduced to 40 per cent. of the cost of shafting for the same distribution by a rope or belt drive.

These figures upon investigation must appeal to the investor, and the improvements constantly going on in this manner of operating cotton mills have reduced the cost until a very substantial gain is the acknowledged result.

—At a meeting of Southern cotton manufacturers held at Lithia Springs, Ga., last month, a plan of mutual cotton mill insurance was discussed and preliminary steps taken for the organization of a corporation to underwrite cotton mill risks in the states of Georgia, the Carolinas and Alabama. It is estimated that a considerable portion of the $800,000 now paid to Eastern companies could be saved by the new system.

—The short time movement in the English cotton spinning mills continued during May, and included 16,000,000 spindles which were operated but four days per week.

—Employees to the number of 102,213 were engaged in textile manufacturing in Pennsylvania, according to the census figures for 1900. Of this large number, which is over 25 per cent. more than was reported for 1890, knitting makes up the largest part with 21,540, or 21 per cent.; silk comes next with 21,028, or 20½ per cent.; cotton, 17,011, or 16½ per cent.; woolen, 13,721, or 13½ per cent.; carpets and rugs, 12,919, or 12½ per cent.; worsted, 10,201, or 10 per cent.; dyeing and finishing, 4716, or 4½ per cent.; the remaining 1½ per cent. is distributed among the shoddy, felt and hat industries.

DYEING DEPARTMENT

Dye Recipes for June.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $4.

Recipe No. 81.

Light Green on Worsted Yarn.

Anthracene Green E B N on 100 lbs. worsted yarn.

Prepare the dye bath with

1 lb. Anthracene Green E B N.

(C. Bischoff & Co., 88 Park Place, New York.)

Dissolved in boiling water and a little ammonia.

Dye at a boil, exhausting the bath by the gradual addition of acetic acid.

Anthracene Green E B N gives a very bright shade of green, which is extremely fast to light and fulling, since it can be dyed on a chrome bottom.

Recipe No. 82.

Brown on Cotton Yarn.

Chlorazol Brown C on 100 lbs. cotton yarn.

Prepare the dye bath with

3 lbs. Chlorazol Brown C.

(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)

25 lbs. Common Salt.

Enter yarn at 180° F., bring to a boil and dye at a boiling temperature for one hour.

Chlorazol Brown C possesses all the characteristic properties of the direct cotton colors, and is rendered extremely fast after treatment with copper sulphate.

Recipe No. 83.

Blue on Worsted Yarn.

Vervier's Alizarine Blue G R Conc. on 100 lbs. worsted yarn.

First mordant the yarn by boiling for one and one-half hours in a bath made up with

3 lbs. Potassium Dichromate.

2 lbs. Tartar.

Enter at 140° F., bring slowly to the boil and after the mordanting lift and rinse.

Then dye in a bath containing

15 lbs. Vervier's Alizarine Blue G R Conc.

(J. W. Linnehan Co. 185 Fort Hill Sq., Boston.)

1 lb. Acetic Acid,

entering the yarn at 140° F., bringing slowly to the boil and dyeing at a boil for one and one-half hours.

Vervier's Alizarine Blue G R Conc. produces a dark, solid shade of blue, possessing the characteristic fastness of the mordant colors.

Recipe No. 84.

Peacock Green on Silk.

Silk Green on 100 lbs. of silk yarn.

Prepare the dye bath with

2 lbs. Silk Green.

(New York & Boston Dyewood Co., 55 Beekman St., New York.)

2 lbs. Acetic Acid.

Addition of boiled off liquors is advantageous if it is at hand.

Enter at 150° F., bring to a boil and dye at this temperature for one hour.

When used alone, Silk Green produces a beautiful shade of peacock green. It is also of great value in topping logwood black on silk. It is a basic color.

Recipe No. 85.

Blue on Cotton Yarn.

Chlorazol Blue 6 G on 100 lbs. of cotton yarn.

Prepare the dye bath with

3 lbs. Chlorazol Blue 6 G.

(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)

10 lbs. Glauber's Salt.

2 lbs. Soap.

Enter yarn at 180° F., bring to a boil and dye at a boiling temperature for one hour.

Chlorazol Blue 6 G possesses all the characteristic properties of the direct cotton colors, and is rendered extremely fast after treatment with copper sulphate.

Recipe No. 86.

Orange on Worsted Yarn.

Milling Orange No. 4 on 100 lbs. of worsted yarn.

Prepare the dye bath with

3 lbs. Milling Orange No. 4.
(Sykes & Street, 85 Water St., New York.)

15 lbs. Glauber's Salt.

4 lbs. Sulphuric Acid.

Enter at 180° F., bring to a boil and dye at a boil for one hour.

Milling Orange No. 4 produces a deep shade of orange, which has excellent fastness.

Recipe No. 87.

Blue on Cotton Yarn.

Solamine Blue R on 100 lbs. of cotton yarn.

Prepare the dye bath with

3 lbs. Solamine Blue R.
(Berlin Aniline Works, 213-215 Water St., New York.)

40 lbs. Calcined Glauber's Salt.

1 lb. Soda Ash.

Enter yarn at 180° F., and dye at 200° F., for one and one-half hours.

Solamine Blue R produces an excellent shade of blue, which possesses extraordinary fastness to light without after treatment.

Recipe No. 88.

Blue Black on Cotton Yarn.

Katigen Blue Black R on 100 lbs. of cotton yarn.

Prepare the dye bath with

20 lbs. Katigen Blue Black R.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

20 lbs. Sulphide of Soda Crystals.

8 lbs. Soda Ash.

50 lbs. Glauber's Salt.

Dye at a boil for one hour, then rinse in a solution containing 3 lbs. of sodium sulphide. After treat for one-half hour at 170° F., in a bath containing

3 lbs. Potassium Dichromate.

3 lbs. Copper Sulphate.

5 lbs. Acetic Acid.

Katigen Blue Black R possesses excellent fastness to light, washing, etc., and also dyes very level.

Recipe No. 89.

Old Gold on Worsted Yarn.

Vervier's Fast Alizarine Yellow G on 100 lbs. worsted yarn.

First mordant the yarn in a bath made up with

3 lbs. Potassium Dichromate.

2 lbs. Tartar.

Enter yarn at 140° F., bring to a boil and boil for one and one-half hours.

Then dye in a bath containing

15 lbs. Vervier's Fast Alizarine Yellow G.
(J. W. Linehan & Co., 185 Fort Hill Sq., Boston.)

1 lb. Acetic Acid.

Entering the yarn at 140° F., bringing slowly to a boil and dyeing at this temperature for one hour.

Vervier's Fast Alizarine Yellow G produces a pleasing shade of old gold, possessing the characteristic fastness of the mordant colors.

Recipe No. 90.

Blue on Cotton Yarn.

Solamine Blue B on 100 lbs. of cotton yarn.

Prepare the dye bath with

3 lbs. Solamine Blue B.
(Berlin Aniline Works, 213-215 Water St., New York.)

40 lbs. Calcined Glauber's Salt.

1 lb. Soda Ash.

Enter yarn at 180° F., and dye at 200° F., for one and one-half hours.

Solamine Blue B produces an excellent shade of blue, which possesses extraordinary fastness to light without after treatment.

Recipe No. 91.

Yellow on Cotton Yarn.

Phenidine Fast Yellow C Y on 100 lbs. cotton yarn.

Prepare the dye bath with

2 lbs. Phenidine Yellow C Y.
(Sykes & Street, 85 Water St., New York.)

30 lbs. Common Salt.

Enter yarn at 180° F., bring to a boil and dye at this temperature for one hour.

Phenidine Fast Yellow C Y produces a full and brilliant shade of yellow, which is comparatively fast.

Recipe No. 92.

Blue on Cotton Yarn.

Immedial Direct Blue B on 100 lbs. of cotton yarn.

Prepare the dye bath with

14 lbs. Immedial Direct Blue B.
(Casella Color Co. 182 Front St., New York.)

2 lbs. Soda Ash.

18 lbs. Sodium Sulphide.

2 lbs. Turkey Red Oil.

25 lbs. Common Salt.

Boil up all the ingredients, before entering the yarn, and then dye the yarn at a boil for one hour, keeping the yarn as much below the surface as possible.

Immedial Direct Blue B produces an excellent shade of blue, possessing the fastness characteristic of the sulphur colors.

Recipe No. 93.

Blue Black on Cotton Yarn.

Katigen Blue Black B on 100 lbs. cotton yarn.

Prepare the dye bath with

20 lbs. Katigen Blue Black B.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

20 lbs. Sulphide of Soda Crystals.

8 lbs. Soda Ash.

50 lbs. Glauber's Salt.

Dye at a boil for one hour, then rinse in a solution containing 3 lbs. of Sodium Sulphide.

After treat for ½ hour at 170° F., in a bath containing

3 lbs. Potassium Dichromate.

3 lbs. Copper Sulphate.

5 lbs. Acetic Acid.

Katigen Blue Black B possesses excellent fastness to light, washing, etc., and also dyes very level.

Recipe No. 94.

Green on Worsted Yarn.

Anthracene Green E B N on 100 lbs. of worsted yarn.

Prepare the dye bath with

4 lbs. Anthracene Green E B N.
(C. Bischoff & Co., 88 Park Place New York.)

(Dissolved in boiling water with a little Ammonia.)

Exhausting the bath by the gradual addition of Acetic Acid.

Anthracene Green E B N gives a very bright shade of green, which is extremely fast to light and fulling, and can be used in combination with alizarines on chrome bottoms.

Recipe No. 95.

Brown on Worsted Yarn.

Chrome Fast Brown B on 100 lbs. of worsted yarn.

Prepare the dye bath with

4 lbs. Chrome Fast Brown B.
(A. Klipstein & Co., 122 Pearl St., New York.)

20 lbs. Glauber's Salt.

4 lbs. Acetic Acid.

Enter yarn at 130° F., raise slowly to the boil and boil one-half hour; add 2 lbs. Sulphuric Acid; boil one-half hour longer, then add one and one-half pounds of Potassium Dichromate and boil one-half hour longer.

Chrome Fast Brown B gives shades which are very fast to light and fulling.

Recipe No. 96.

Orange on Cotton Yarn.

Toluylene Orange R on 100 lbs. cotton yarn.

Prepare the dye bath with

3 lbs. Toluylene Orange R.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

30 lbs. Glauber's Salt.

2 lbs. Soda Ash.

Enter at 180° F., bring to a boil and dye at a boil for one hour.

Toluylene Orange R, although pro-

ducing a good shade of reddish orange, will be found of greater value in the production of bright chestnut shades by developing with Benzo Nitrol or Paranitraniline. When developed in this way an extremely fast color is produced.

Sulphur Blacks, and Their Action upon Cellulose.

BY LOUIS J. MATOS.

The discovery of the sulphur coloring matter dates from the success, in 1873, of Croessant and Bretonneus, who produced what is now known commercially as Cachou de Laval, and which discovery has been regarded as the prime starting point from which the subsequent sulphur coloring matters have been developed.

It is not my purpose to review the details of the several important discoveries made along that line of research, as such has been very fully recorded in the pages of this journal, but to draw attention to a few main points, bearing upon the practical application of this now extremely important group of cotton colors.

The manufacture of all the sulphur colors is carried out on generally the same principle, that of making a "melt" of certain nitrogenous organic substances with caustic soda, sodium sulphide, and free sulphur. This fusion is conducted in large cast-iron pots, supported in brickwork, and suitably inserted over a fire.

The duration of the fusion depends upon the nature of the raw product, but in nearly all cases it is stopped when a test sample of the melt is found to dissolve completely in water. Some of the commercial products are ready for the market without further treatment, while others are subjected to a subsequent baking in large pans suspended one above the other in a large externally heated oven.

Depending upon the particular process of treatment, and governed by the raw materials, the finished product may be dense and tough, sometimes hygroscopic, whilst, in other cases, it may be porous and brittle, resembling coke.

The technical importance of these new Blacks to the textile industry is their great value in producing shades of the utmost intensity and with a minimum of expense, and combining to a remarkable degree the qualities of extreme fastness to exposure to weather, light, ordinary washing, soaping acids, and alkalies. Of course these qualities are relative, as all the black sulphur products are not exactly alike in their several properties.

Compared with the ordinary types of Blacks for cotton (excluding those obtained from logwood or other similar sources), we find that, in the Sulphur Blacks, we have products yielding shades that more nearly approach those obtained from aniline, and which are, in many respects, equally as fast.

We further find that the practical details for producing a high grade black are much simpler than for the same depth of black by the aniline process.

In comparison with the ordinary direct dyeing Blacks, it is found in practice that the dyeings obtained from the sulphur products are always superior in point of fastness; and that when compared with the so-called diazotizing and developing Blacks, there are a number of details in connection with the latter to be carefully watched, in order to guard against off shades, unevenness, and lastly, tendering of the fibres, defects not prominent with the Sulphur Blacks.

This latter complaint has been also made in reference to the Sulphur Blacks, however, and the present paper is intended to direct particular attention to this subject.

As Sulphur Blacks are of importance only to the cotton dyer, the general details as followed in practice will be briefly outlined. The dye bath is made up with a sufficient volume of water, to which dissolved dyestuff is added, together with sodium sulphide

—in some cases caustic soda also—and always common salt or Glauber's salt, to increase the density of the dye bath.

The material to be dyed is then immersed, the temperature gradually brought to the boiling point, and maintained for about one hour, during which time the cotton is worked, in order to ensure level or even shades.

Other classes of the Sulphur Blacks do not require the addition of sodium sulphide to the dye bath, but the addition of a small quantity of soda ash is regarded as an advantage.

Thus, we are likely to find in the dye bath, besides the dyestuff, one or more of the following substances: Sodium chloride; sodium sulphate; sodium sulphide; caustic soda (sodium hydrate); sodium carbonate; regarding the action of which, upon cellulose, in the form of chemically cleaned cotton threads, the subjoined notes may be of interest.

All the experiments were made parallel, and under strictly the same conditions, and upon the same material. Test samples were frequently taken and subjected to tension in the dynamometer, to ensure regularity and uniformity throughout each series.

Action of boiling aqueous solutions on Sulphur Black (St. Denis Black, B).—Ten grms. of fine cotton was boiled for one hour in a simple 1 per cent. solution of the black, loss of water prevented by means of a reflex condenser. After boiling and washing the yarn, drying under normal conditions without the aid of heat, no loss of strength was noticed in an average of 30 tests.

Action of dilute solutions of sodium chloride.—Same apparatus, strength of solution, time, etc.:—27 tests; loss 0.47.

Action of dilute solution of neutral sodium sulphate.—Only 5 tests were made with this salt, the results of which showed no action on the thread.

Action of dilute solution of sodium sulphide.—The commercial crystallized article was used for this series of tests. Solution, 1 per cent. strength. 24 tests were made. Normal yarn, 100; average of 24 tests, 94.2. Maximum, 98.3; minimum, 88.56.

Action of dilute solution of caustic soda.—One per cent. solution. One hour boil. Yarn washed and dried at normal temperature. Average of 21 tests; no practical loss.

Action of dilute solutions of sodium carbonate.—One per cent. solution. One hour boil. Average of 14 tests; no loss.

From these tests we are led to conclude that there is some slight loss in strength of the material dyed, but then it must also be remembered that the treatment received by similar material in actual practice would not be nearly so severe, and that the loss of strength of the dyed material would be very much less.

Operations subsequent to dyeing, as applied to the Sulphur Blacks, may be only washing and soaping, or a "fixing" in a special bath containing certain metallic salts in solution, usually in the presence of some acid. The object of fixing as applied to those sulphur colors that require it, is to cause a deposition of the black color base on the fibre substance.

When such dyed and "fixed" fibres are examined under the microscope, however, no evidence of insoluble particles are discernible, but we are safe in assuming that such deposition is the case in view of the well-known reactions of the Sulphur Blacks when in solution.

The fixing baths, as usually made up, contain as a maximum, five per cent. of bichromate of potassium or sulphate of copper; sometimes mixtures of these two salts are employed, in which case the combined amount rarely exceeds six per cent.

As a rule, one and one-half per cent. to four per cent. of sulphuric acid, or three to six per cent. of acetic acid is used, according to circumstances, all calculations being upon the weight of the cotton. The temperature of the bath is usually kept at 75° C., and the

duration of the immersion from one-quarter to one-half hour.

The influence of this fixing bath upon the black as dyed is to cause it to become almost absolutely fast to the most severe milling, and unless insufficiently washed before fixing will in no instance stain adjacent white material.

The action of the fixing bath upon the fibre substance is of importance. Owing to the character of the ingredients used, we might infer that some distinctive action would take place, but this does not happen.

A series of tests were made upon clean cotton yarn; same yarn, dyed; same yarn, dyed and fixed; and the loss in strength, due to the subsequent fixing, was inappreciable. The action of the chrome fixing bath, however, when allowed to act for several hours upon either dyed or undyed cotton, has a marked influence upon the strength, but when the immersion is only one-half hour at most, and at a moderate temperature, no loss was recorded.

When objections have been raised to the loss of strength suffered by the dyed yarn in cases where it has been "fixed" in the manner described, this loss has been traced directly to insufficient washing after fixing, and then when sulphuric acid was used.

Summing up the observations, we note that the several components of the dye bath, either alone or in combination, have no appreciable effect upon the cotton fibre; that the subsequent "fixing" bath, or its several constituents, is likewise free from action, when used at the usual temperature of 75° C.; that failure to wash the dyed and fixed material thoroughly, thereby allowing traces of acid to remain in the fibre, is a cause of fibre weakness; and it has been practically demonstrated, upon large scale tests, that where ample washing was done, the dyed and finished material had lost none of its original strength.

Bleaching Wool with Sulphur.

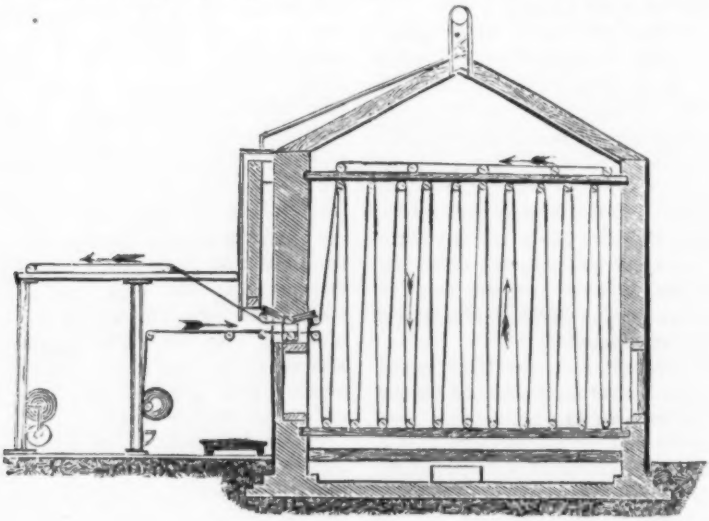
Wool is bleached by sulphurous acid in various forms: 1. Sulphurous acid gas generated by burning sulphur; 2, solutions of water and sulphurous acid or bi-sulphate of soda; chloride of lime is not at all suited for bleaching wool, as it dissolves the wool fibre.

Bleaching wool with sulphur is one of the oldest and cheapest methods known, and the one most frequently employed. In the early Middle Ages, this process was well known and carried on in the same way as at the present time. The rooms in which wool is bleached with burning sulphur today are, in principle, identical with those used in the earliest times. The sulphur room is an indispensable adjunct to this process, and a very large number of them are in use by our manufacturers; hardly two of them are built in the same way. Each bleacher has his own ideas, and adopts his own dimensions for the bleaching chamber. The illustration accompanying this article shows the general plan adopted for what is called the sulphur room.

The room should be as nearly air-tight as possible, and provided with a grate or hearth on which the sulphur can be burned by means of live coals. The room should be heated by steam pipes placed next the roof, to prevent the condensation of the water and the sulphurous acid vapors; otherwise the drops fall on the wool, causing spots difficult and even impossible to remove.

At the lower part of the door and in the roof, small holes should be provided to supply the air required for the free burning of the sulphur. In most cases the sulphur room is a rectangular brick building without windows; the length varies from 15 to 30 feet, with width and height about the same. The building may be covered with either a gable or slanting roof, and the pitch should

not be less than 4 inches to a foot. Generally the roof is built of wood, but copper is a very durable material, although expensive. A wood roof lined with copper or lead answers every purpose. Copper and brass nails should be used for fastening the lining, as iron corrodes, and is apt to cause trouble by spotting the goods. On the roof or side of the building, there should be numerous openings that can be opened or closed as desired, by which the vapor laden air is allowed to escape quickly at the end of the bleaching process. In many sulphur rooms the door is made large, and on the opposite side a large window that can be opened or closed as desired, is inserted. Opening both the door and window creates a draft, by which the room is quickly and thoroughly freed from the sulphurous vapor. As little iron as possible should be used in the construction of the building, as it lasts but a short time in the presence of the acid.



A SULPHUR HOUSE.

The illustration shows a sulphur room adapted for light flannels and similar materials. Generally, as already stated, the sulphur and live coals are placed in a suitable receptacle in the middle of the room. This method is objectionable where the room is very large, and in such case it is preferable to burn the sulphur outside and carry the vapor by pipes to the bleaching room. In this way it is not necessary to heat the bleaching room to prevent condensation. The gas should be introduced into the room near the roof; two, three or four hearths are needed, according to the size of the room. It is important to secure a good combustion of the sulphur and avoid sublimation. To this end, it is well to have water constantly standing in the bleaching room; to take the place of the water steam is sometimes introduced. Woolen yarn should be bleached while damp but not dripping wet; it should be opened up well on the rods; loose wool is spread loosely on the racks. Yarn is seldom bleached by this process, as good results are not easily attained. The sulphurous acid vapor process is better for yarn bleaching, and will be described in a subsequent article.

Piece goods are bleached as the pieces pass through the room. The goods in the open width enter the small opening in the side of the room, pass over numerous rolls, and then are carried out through the same

opening by which they entered. Wool is left in the bleach from two to four hours according to the grade and weight of the goods, and the degree of whiteness desired. Sulphur equal to 5 or 10 per cent. of the weight of the cloth is used. —Joclet's Chemical Handling of Wool.

Testing the Fastness of Colors.

I noticed an inquiry by "Schnell," in the Textile World for May, in regard to the best method of testing the fastness of colors. I will call his attention to a small apparatus made for testing the fastness of colors to sunlight.

It consists of a movable lens, by

DEVICE FOR TESTING COLORS.

which the sun's rays are focused upon the cloth; the accompanying illustration shows plainly the construction of the device. The lens is attached to a framework having a piece on which the sample to be tested is fixed. The lens is then adjusted so that the sun's rays are focused on the sample, and the exposure by this means for a few hours is equal to as many days exposure to ordinary sunlight. A color that stands eight hours without fading may be considered fast, and the time required to change the shade is a very good guide as to its fastness.

This simple apparatus will greatly facilitate Schnell's tests and, therefore, may prove of interest to him. Focus.

Mildew.

Mildew in woolen, as well as in cotton fabrics, is traceable to a fungoid vegetating at certain temperatures in presence of damp air. Summer weather is particularly favorable to the growth of the fungoid, August being the month especially favored.

Certain dyes, for instance vat blue, are particularly given to develop this parasite, this peculiarity very likely being accounted for by the alkaline nature of the lakes. There are two kinds of fungi which make their appearance during the weaving operations.

If the cloth remains cold, the fibre itself is not attacked, and dark hues are hardly, if ever, injured. The mildew spreads superficially over a large space, and is easily removable with a brush.

The case, however, becomes serious if the parasite originates in a hot cloth. It then appears in smaller or larger patches, and generally destroys the fibre. Stains of this description leave bare spots after milling.

—Self-love is dignity in plaster.—H. Murger.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Huntsville. The Dallas Manufacturing Company will install 28,700 ring spindles and 790 looms in the No. 2 mill, which has been built, but not equipped with machinery. This will give the plant a total of 54,300 ring spindles, 700 broad and 888 narrow looms, when completed, which they expect will be about September, 1902. Fine sheetings, 36 to 108 inches will be made.

—*Alabama, Pell City. The Pell City Manufacturing Co. has been incorporated with capital stock of $500,000. Geo. W. Pratt is president of the concern. Surveys for the mill site are now being made and as soon as the plans have been completed, work will start on construction of buildings. The main building will be about 500x150 feet, 3 stories and equipped with about 12,000 spindles. Denim will be made.

—*Arkansas, Monticello. The Monticello Cordage Mills have been incorporated with capital stock of $20,000, and will start at once toward establishing the plant previously reported contemplated. Maj. W. M. Anderson is president of the company.

—Connecticut, Norwichtown. Courtland Beebe has started a small plant here for making cotton cordage; clothes lines, factory banding, sash cords, drum and clock cords, fish lines, etc., being made.

—*Georgia, Griffin. At a meeting held recently by the stockholders of the Boyd-Mangham Cotton Mill, company was capitalized at $125,000. Douglas Boyd was elected president; J. W. Mangham, secretary; J. Arthur Sasser, vice-president, and J. J. Mangham, treasurer.

—*Georgia, Lindale. The new mill for the Massachusetts Mills in Georgia, upon which work of construction has already begun, will be completed about Jan. 1, 1903. Capital stock of the company, now $1,000,000, will be increased to $2,000,000 when addition is completed. They will install 42,000 ring spindles and 1262 looms in the mill.

—*Louisiana, Alexandria. The Alexandria Cotton Mills have been organized recently with capital stock of $75,000; Paul Lesso, president; T. P. Sullivan, vice-president; Iddo Ball, treasurer and I. W. Sylvester, secretary. A committee will be appointed to examine the machinery at the Mammoth Springs Mills (for sale), which they will probably use.

—Maryland, Baltimore. The Whitehurst Belting Company has completed their new factory, in which are installed looms, of special design and patented, for weaving heavy duck. Spindles are to be installed for making the yarns.

—*Massachusetts, Fall River. Contract has been let for erection of the Davis Mills and work will start at once on construction. Building will be 316 by 156 feet, three stories, granite. Details of the plant previously reported in issue of March 7th.

—*Massachusetts, New Bedford. Contract for the erection of the Butler Mill has been let to B. F. Smith of Pawtucket, R. I. At a meeting held recently by the stockholders, it was voted to increase the capital stock from $700,000 to $1,000,000. It is expected that the spinning mill will be ready for operations about October 1st, and the weave shed November 15th.

—*Mississippi, Aberdeen. The Aberdeen Cotton Mills will be organized with capital stock of $250,000, as soon as the entire subscription for stock has been subscribed. W. M. Stokes will be treasurer of the concern, which will probably make coarse sheetings, although this has not yet been definitely decided upon. They propose having an equipment of 10,000 spindles and 350 looms, to be operated by steam power. Others interested are: W. M. Paine, B. P. Holliday and W. W. Watkins.

—*Mississippi, Lexington. The project of establishing a cotton mill at this place is again being agitated. At a meeting recently held $55,000 was subscribed and officers chosen, viz.: G. A. Wilson, president; M. M. Raynor, vice-president, and J. E. Stanfield, secretary and treasurer. Further details will be taken up later.

—*Mississippi, Magnolia. The Magnolia Cotton Mills, recently incorporated with capital stock of $100,000, will start work on construction of buildings about June 15. L. L. Lampton is president of the company, T. B. Lampton treasurer, and S. R. Stevens, superintendent. They will make 5.5 yd. sheetings and yarns, 20s to 30s. Mill will be equipped with 5,000 ring spindles and 160 looms.

—*Mississippi, Starkville. Work will be started this month on construction of the new buildings for the Stone Cotton Mill Co., site for same having been secured.

—Missouri, Kansas City. Efforts are being made to establish a good sized cotton mill at this place. W. B. Smith-Whaley, the mill engineer of Boston, Mass., and Columbia has been called in consultation and is now in Kansas City looking over the ground in conference with the promoters.

—*North Carolina, Bessemer City. The Bessemer City Mills will start operations in July. John A. Smith is president of the company; John M. Sharpe, secretary and treasurer, and Geo. F. Ivey, general superintendent. They will manufacture colored goods.

—North Carolina, Charlotte. H. A. Cook & Co. have completed the erection of a batting mill in connection with the bagging and tie plant. The new plant has capacity of 2000 to 2500 lbs. batting per day.

—*North Carolina, Durham. The new mill to be built by the Erwin Cotton Mills Co. will be known as Mill No. 2. Plant will have an equipment of about 35,000 spindles and 1000 looms. Work will start on construction of buildings within next thirty or sixty days.

—*South Carolina, Easley. The Glenwood Cotton Mills, previously reported to erect a plant of about 10,000 spindles, have increased the capital stock from $200,000 to $250,000, and will install 16,320 spindles and 412 looms, instead of 10,000 and 300 respectively. The main building will be 105x256 feet. Fine sheetings will be made. Lockwood, Greene & Co., Boston, Mass., have been appointed engineers in charge. Contract for building has been let to J. F. Grady.

—South Carolina, Greenville. A new mill, to be known as the Woodside Cotton Mill, is to be erected at this place. The company is being organized with capital stock of $200,000. John T. Woodside will be president and J. D. Woodside, of Gainesville, Ga., treasurer. About $57,500 has been subscribed so far toward the necessary capital.

—*South Carolina, Greenwood. At meeting held recently by the stockholders of the Greenwood Mill, it was mentioned that the directors start investigations for building the No. 2 Mill, reported as proposed last year. The equipment of the plant is to be about 10,000 spindles with other machinery in proportion.

—North Carolina, Henrietta. The Cliffside Cotton Mills (P. O. Address, Cliffside), will soon be ready for operations. One wing of the plant is 58 by 108 feet, three stories and the other 75 by 224, four stories. B. D. Heath is president of the company and R. R. Haynes, secretary and treasurer.

—*South Carolina, Anderson. The new cotton mill to be erected here will be known as the Brogon Cotton Mills, with capital stock of $500,000. J. A. Brock is president of the company and Robt. E. Ligon, treasurer. Mill is to be equipped with 20,000 spindles and 700 looms, but it has not yet been definitely decided what will be made. Dyehouse will be attached and plant operated by steam. Woodward, Baldwin & Co. will sell the goods, which they propose producing by Jan. 1st, 1903. R. L. Cumnock will be superintendent of the plant.

—*South Carolina, Honepath. Work has been started on construction of the new plant for the Chiquola Manufacturing Company, recently incorporated with capital stock of $200,000, James D. Hammett, president and treasurer. The mill is to be equipped with 11,280 ring spindles and 300 looms. Forty inch cloths for converting trade will be made. Woodward, Baldwin & Co., New York, will sell the product. Expect to be ready to start production January 1st, 1903, with J. D. Tice, superintendent.

—*North Carolina, Salisbury. The Kesler Mfg. Co., previously reported to increase the capital stock to about $175,000, for purpose of making additions to the plant, advise us that they will install 200 looms for weaving, probably sheeting, although this is as yet undecided. Work on construction of new building will start in about two weeks and they contemplate starting same up in about four months.

—*South Carolina, Spartanburg. S. M. Milliken (New York), Edwin F. Green (Lockwood, Green & Co., Boston, Mass.) and John H. Montgomery, we learn are also interested in the new cotton mill proposed here as the Drayton Mills Co.

—South Carolina, Tucapau.—The Tucapau Mill will start work shortly on the erection of Mill No. 2, with capacity of 30,000 spindles and 839 looms, to be operated by electricity.

Enlargements and Improvements.

—Alabama, Birmingham. The Avondale Cotton Mills are to install 22 new looms in the plant, increasing the looms to 1174 when placed. As additions are being made constantly, it is thought that more looms will be added next year.

—Alabama, Girard. The Girard Cotton Mills, of which O. S. Jordan is president and A. S. Mathewson, treasurer, will be enlarged by the installation of 6000 spindles and 160 looms. Work has been started on foundation of new building in which the additional machinery will be installed.

—*Georgia, Banning. W. T. Roberts is now president of the Hutcheson Manufacturing Co., in which he and Col. L. S. Roan have recently purchased the controlling interest. They will install some new machinery this summer.

—*Georgia, Griffin. The Kincaid Manufacturing Company informs us that they have placed orders for 3500 additional spindles and 128 looms, to be installed in the plant. An addition of 45 feet is under construction to the main building.

—Georgia, Rome. The capital stock of the Anchor Duck Mills has been increased to $100,000, and the capacity of the plant will be increased. A new building, two stories high, will be built and 5,000 spindles and 20 looms installed. C. E. McLin is superintendent of the plant.

—Georgia, West Point. The Langley Manufacturing Co., manufacturing Jacquard specialties, lap robes, portieres, etc., is installing a dyeing and bleaching plant in the mill.

—Georgia, Toccoa. The Capps Cotton Mills Co. are to install 65 looms and other machinery in the plant for weaving. The mill is now equipped with 2080 spindles for making yarns.

—*Georgia, Winder. The Winder Cottin Mills, reported to install looms, advise us that four new cards and 108 looms are being put in to make 2.40 denim.

—*Massachusetts, Fall River. The Barnaby Manufacturing Company has voted to increase the capital stock from $400,000 to $500,000, for making improvements and additions. They contemplate adding a new motive plant to increase the spinning capacity about 25 per cent. and to increase the number of looms to 1000.

—*Massachusetts, New Bedford. The Dartmouth Mills have started removing the looms to the new mill.

—*Massachusetts, Waltham. Work has been started by the Boston Manufacturing Company, making extensive improvements to their cotton mill. Part of Mill No. 1 will be used for storage of goods, the other to be equipped with machinery for preparing the warps. In Mill No. 2, the weaving room will be on the first floor and mule spinning on the fourth. They will install 5000 more spindles. A new power house will be built on the east side of Mill No. 3, and all the engines eventually removed there. Mill No. 4 will be operated by electricity, the power house being under construction. The building on the south side of Mill No. 1, formerly used as a drying department, has been removed.

—New York, New York Mills. The New York Mills are building an addition to the yarn plant.

—New York, Utica. The Utica Steam and Mohawk Valley Cotton Mills will build a new mill on the east side of State Street, 175 feet long ,one story.

—*North Carolina, Cooleemee. Instead of erecting a weave shed as previously reported, the Cooleemee Cotton Mills have decided to build an addition of 150 feet, three stories, to the main mill.

—*North Carolina, Goldsboro. The capacity of the Borden Manufacturing Co.'s plant is to be increased. Contract has been let for the erection of an addition, 50 feet long, to the main building.

—North Carolina, High Shoals. The High Shoals Cotton Mills, operating 5000 spindles and 164 looms, on sheetings and yarns, are to double the capacity of the plant. Work has been started on the foundations for a new building, 80 by 152 feet, four stories, brick, which it is expected will be completed by September.

—*North Carolina, Lumberton. The Lumberton Cotton Mills, previously reported to install additional machinery in the plant, inform us that they now operate 5000 spindles and will add 834 and 36 Universal winders. This concern makes Nos. 10s to 32s yarns.

—*North Carolina, Mooresville. The Mooresville Cotton Mills, reported to increase the capacity of their plant, expect to add about 100 looms. They now operate 8700 spindles and 181 looms.

—Pennsylvania, Chester. An addition is to be built to S. A. Crozer & Son's mill. The building will be about 50 by 30 feet. They will install 20 looms in the new addition for making cloth, 23 by 36 inches wide.

—Pennsylvania, Philadelphia. A new weaving mill is to be built by the Davies Textile Co., at cost of about $25,000.

—*Pennsylvania, Wilkes Barre. The Wilkes Barre Lace Mfg. Co. has voted to increase the capital stock from $500,000 to $1,000,000, in order to make necessary improvements to the mill.

—Rhode Island, Central Falls. The United States Cotton Company, manufacturers of print cloths and odd goods, have installed about 40 new looms.

—South Carolina, Glendale. An addition is to be built for the D. E. Converse Company, in which 17,000 spindles and proportionate number of looms, will be installed.

—South Carolina, Greenwood. The Grendel Mills are to install 2000 additional spindles in the plant shortly.

—South Carolina, Spartanburg. The Spartan Mills are to add 5000 spindles to the plant.

—*South Carolina, Spartanburg. The Spartan Mills will not erect any new building for the 5000 spindles they are adding to No. 2 mill, simply filling up space.

—*South Carolina, Westminster. The Cheswell Cotton Mills Company has decided to make additions to the mill and about $75,000 will be expended for the purpose. They will start work at once installing 5000 additional spindles and 152 looms, giving them a total, when completed, of about 11,000 spindles and 330 looms.

—*Tennessee, Knoxville. The Brookside Mills, which have recently increased their capital stock to $1,000,000, will equip the new mill, to be built, with 27,000 spindles and 700 looms. The building will be four stories. A new cotton warehouse will also be built and a two-story addition made to Mil No. 1. The company which makes fine odd goods, now operates 28,600 spindles and 652 looms.

Mills Starting Up.

—*Georgia, Barnesville. The directors recently elected by the stockholders of the Barnesville Manufacturing Company, at recent meeting, have decided to put the mill in operation at an early date. Capt. Hough, of Macon, has been appointed agent and will take active management of the plant on June 1st.

Mills Shutting Down.

—Pennsylvania, Wilkes Barre. Operations have been suspended in the plant of the Sun Narrow Fabric Co. until the financial affairs of the firm can be adjusted. Their plant was twice damaged by floods within three months, causing heavy loss.

Woolen.

New Mills.

—*Connecticut, Stamford. The new mill to be established here by Messrs. John W. Nary and A. Schwartz, will be known as the Stamford Worsted Mills. Fine worsteds will be made. Mill will be equipped with 100 looms, operated by steam and have dye house attached. Goods are to be sold direct.

—Kansas, Wichita. W. E. Lawrence has leased space at 223 South Main St. and will soon start manufacturing rugs. It is expected that operations will be started May 10th. Rugs from old Brussels, velvet, ingrain, etc., will be made, also chenille curtains.

—*Kentucky, Louisville. The Eclipse Woolen Mills have been incorporated with capital stock of $150,000; David A. Chenowith, president; Oscar B. Chenowith, vice-president, and John P. Chenowith, secretary and treasurer. It is expected that the mill will be ready to resume operations in about sixty days.

—Massachusetts, Newton. Geo. F. Hall is now operating the Nonantum Mills, as the Nonantum Worsted Company, on worsted yarns (Bradford System). John Healy is superintendent of the mill, which has about 2000 spindles.

—Massachusetts, Taunton. The Taunton Wool Stock Co. has been incorporated recently with capital stock of $21,000, for purpose of manufacturing wool shoddy and wool extracts, spinning and weaving, and decarbonizing rags. Ellis Hey is president of the concern and William M. Lovering, treasurer.

—*Massachusetts, Webster. The Merritt Woolen Company has been incorporated under New Jersey laws, with capital stock of $50,000 for manufacturing worsted goods. Josiah Perry, Andrew J. Batts, R.E. Horton and Henry Merritt are the incorporators.

—*Michigan, Deckerville. Preparations are being made by A. Jones, who purchased the machinery of the Minden Woolen Mills, to erect the woolen mill building and have same ready for operations when season begins.

—New York, New Hartford. A company has been formed by William H. Cloher, Jr., to purchase the plant formerly operated by Armstrong, Baker & Co., which failed. New machinery will be installed, which will give the plant a capacity of 400 dozen men's wear daily. It is thought that operations will begin about July 1st. Electricity will probably be used as motive power in addition to the water power.

—*Pennsylvania, Chester. The Richardson & Ross Manufacturing Company, recently incorporated, with B. F .Richardson, president; D. H. Ross, treasurer, W. K. P. Roberts, general mgr., and A. C. Roberts, superintendent, has started manufacturing cotton and woolen goods for men's wear. They operate 2 sets cards and 100 looms. The mill is equipped with a dye house and operated by steam. James Talcott, N. Y., sells the goods.

—*Rhode Island, Bridgeton. The Laurel Hill Yarn Company contemplates having the new plant ready for operation about August 1. The company has a capital stock of $25,000, with F. A. Inman, president; O. T. Inman, treasurer, and J. H. Hamilton, superintendent. They will make woolen and merino yarns, operating four sets new cards, which will be installed. They will sell product direct.

—*Rhode Island, Chepachet. The Chepachet Yarn Company is name adopted by the company now operating here, manufacturing all sizes woolen yarns. The mill is equipped with 5 sets cards and operated by steam and water power. Goods are sold direct.

—*Washington, Seattle. The Australian-American Woolen Co., 321 Globe Block, is being formed with capital stock of $1,250,000, to build a new mill at this place. R. A. Alley is local representative for the company. The plant will be operated by steam and electricity and will have dyehouse attached. This is the company in which Australian and New Zealand capitalists are interested.

—Wisconsin, Beaver Dam .The Beaver Dam Woolen Mfg. Co. has been incorporated with a capital stock of $75,000, to operate the plant of the Beaver Dam Worsted Mills, which has been purchased. M. A. Jacobs is president; T. D. Lawrence, vice-president; Peter Beule, treasurer; Peter Pfeiffer, secretary and William Harley, superintendent. Operations will soon be commenced.

Enlargements and Improvements.

—Massachusetts, Athol. Work will start at once on making important improvements and enlargements to the Miller's River Mfg. Co.'s mill. C. H. Cutting & Co., Worcester, have secured the contract. It is proposed to cut off the present tower and build a three-story building on the west end of the plant. Machinery will be increased to 6 sets and other equipment added. Picker house will be enlarged and a 100 h. p. engine installed. It is expected to have the plant in full operation July 15th.

—Massachusetts, Holyoke. Beebe, Webber & Co. have leased the plant formerly operated by Connor Bros. and will start same up in addition to present plant. Company has given up the plant at Spencer.

—*Massachusetts, Hubbardston. Jas. E. McWilliam, manager of the Hygienic Blanket Company, informs us that he has completed the erection of a new mill, 200 by 42 feet, 3 stories high, near the present plant. Plant will be capitalized at $100,000, one third of which has already been subscribed.

—Massachusetts, Lawrence. Work has been started on the erection of an addition, two stories, to the wool scouring mill operated by E. Frank Lewis. This will be built between the present plant and the Butler mill, recently purchased by him. The new annex will be used for scouring and drying.

—Massachusetts, Methuen. An addition is being built to John W. Jowett's yarn mill.

—*Massachusetts, Spencer. Leavitt & Goldberg, operating a mill at this place, manufacturing satinets, write us that they will install no new looms at present. The new boiler is nearly set. Company operates 3 sets cards and 24 looms. Plant is also equipped with a dyehouse. Lane & Barrows sell the goods. Operations were first started in February, 1902.

—*Minnesota, Fosston. The Fosston Woolen Mill has been closed while additional machinery has been installed. They have added two looms, one set cards, spoolers and twisters. A new warehouse, 26 by 80 feet, is under construction, and a picker room, 14 by 24 feet

—*New Jersey, Gloucester City. Work has been started on construction of the

new building for the Fries-Harley Company. Building will be 450 by 50 feet, three stories. New machinery, which has been ordered, will be installed. They expect to have the new addition in operation early in July.

—*Pennsylvania, Siverly. The Edwards Woolen Co., now at Spartansburg, will be located in their new quarters at this place, after August 15th. A new brick building, 125 by 45 feet, with annex 45 by 60 feet, is being erected. When started up they will operate 2 sets cards and 18 looms and 1080 woolen spindles, the additional machinery having been purchased.

—Vermont, Ludlow. Preparations are being made by the Black River Woolen Co., to make extensive repairs to the plant. A new brick dyehouse and engine house are mentioned as among the improvements.

Mills Starting Up.

—*Indiana, Peru. The Peru Woolen Mills, recently purchased by Blake & Co., of Racine, Wis., are being made ready to start operations. F. J. Corcoran, formerly at the Racine Mill, will be general manager of the new plant, John Arnold taking Mr. Corcoran's place at Racine.

—Massachusetts, Uxbridge. The Capron Satinet Mill, operated by Royal C. Taft, but idle for the past four years, will be leased by Winfield Scott of East Brookfield, Mass., manufacturer of woolens. Repairs are to be made to the plant and operations started as soon as arrangements are completed, which, it is thought, will be about July 1st.

—Rhode Island, Potter Hill. The Wyoming Flock Company will operate the carding and spinning departments of the Campbell Mills of the estate of J. P. Campbell & Co., of which James M. Scott is trustee. They will manufacture yarns, and will probably start work in a few days.

Mills Shutting Down.

—*Pennsylvania, Philadelphia. A sheriff's levy has been made on the Waverly Worsted Mills' machinery. William H. Humphreys is agent and manager of the concern. It is stated that the claims of the operatives for wages due, will be settled shortly and operations started up soon again.

Knit.

New Mills.

—Connecticut, Norwich. J. E. Fenner, now of Rochdale, Mass., writes us that he expects to start a knitting mill in Norwich, in what is known as the Blissville Mill, near Taftville Station, and that he will be in the market for a complete outfit for one set of 48 in. or 60 in. cards and operator, picker and all necessary machinery for manufacturing woolen yarn, also knitting machinery, finishing and dyeing for men's half hose. He expects to put in mostly second hand machinery to start with.

—*Georgia, Cedartown. The Cherokee Knitting Mill, recently reported incorporated ,and of which H. F. B. Booth will be general manager and superintendent, expects to start operations about June 1st. The mill will be equipped with 12 cylinders and 35 sewing machines, for making men's underwear. Goods will be sold direct and through J. P. Graff & Co., New York.

—*Maine, Portland. The Royal Gem Mills Co. has been organized with a capital stock of $1,000,000, to manufacture knit goods and cotton, wool and silk fabrics. Charles M. Drummond is president of the company and Josiah H. Drummond treasurer. Henry Endicott, Jr., and John C. Rice of Boston are among the directors.

—*New Jersey, Alloway. The Alloway Knitting Mills Co. has been incorporated with capital stock of $100,000. John F. Ayres, M. H. Ewen, W. L. Ewen and J. W. Ecton are the incorporators. They will operate the machinery formerly used by the Priscilla Knitting Mills at Salem. W. H. Brayton of Griffin, Ga., will probably have charge of the plant.

—*New York, Fort Plain. The new knitting mill to be established here by Messrs. Schoen & Abeel will be known as the Fort Plain Hosiery Company. They will manufacture men's half hose. The machinery is expected to arrive next week, and operations will be started as soon as possible.

—New York, Newark. J. J. Smith is interested in a new knitting mill being started up at this place for manufacturing cotton half hose. Plant will do its own dyeing.

—*New York, Oneida. George E. Johnson has become associated with J. L. Johnson in the new knitting mill at this place. They will operate plant as the Agatha Hosiery Co.

—*New York, Prospect. The new knitting mill to be erected at this place will be operated by David France, for manufacturing sweaters and specialties.

—*New York, Utica. L. A. Lincoln is president and F. S. Baker, secretary and treasurer of the Otter Knitting Co., recently reported incorporated with capital stock of $5000. They will manufacture ladies' goods and will operate about 27 machines.

—New York, Valatie. Operations will begin about May 1st in W. A. Harder's knitting mill, making high grade plain and fancy colors ribbed underwear. This plant, together with the yarn plant, will operate as the Harder Manufacturing Company, of which W .A. Harder is president and treasurer and Thomas Trimbie, secretary and superintendent. Mill will have capacity of 600 dozen per day at start.

—*Pennsylvania, Allentown. The Southdown Knitting Company, which has begun work on construction of the new mill, expects to be able to occupy same about September. About 50 new knitting machines and 75 sewing machines will be installed. Concern makes high grade of ladies' underwear.

—*Pennsylvania, Collegeville. Operations will start about June by the Perkiomen Knitting Mills, a new concern in which Burgess William Todd and Herbert Spooner are interested. The boiler and engine are already in place and knitting machinery is expected shortly.

—*Pennsylvania, Nanticoke. Ladies lace hose, fine gauge, 216 needle, is made at the Nanticoke Knitting Mill, Paul Barrall, proprietor. Wm. Marville is superintendent of the plant, which is equipped with 17 knitting machines and operated by steam power.

Pennsylvania, Norristown. The Penn Knitting Company is a new concern recently formed by Harry and Henry H. Hobensack, Douglas J. Stewart and Geo. W. Kite, to manufacture hosiery, underware and other knit goods.

—*Pennsylvania, Watsontown. The Watsontown Knitting Company has made an application for a charter. About 40 more machines will be added to the equipment and the mill enlarged.

—*South Carolina, Bowling Green. Operations are expected to start about June 1st in the new plant of the Bowling Green Knitting Mills, which will manufacture ribbed underwear and union suits.

—South Carolina, Cross Hill. The Cross Hill Oil Mill Co. has recently awarded contract for erection of two buildings, 32 by 100 feet, and dyehouse, 32 by 40 feet. They will install 30 full automatic knitting machines and complement, for manufacturing men's, women's and children's hosiery. Plant is to have capacity of 200 doz. per day.

—*Utah, Salt Lake City. The Western Knitting Company, recently incorporated with a capital stock of $50,000, absorbs the plants of the Ogden Knitting Factory at Ogden and the Provo Knitting Factory at Provo. Jos. A. West is president and superintendent of the company and Joel Ricks, treasurer. They manufacture all kinds of knit underwear, and will add 16 new machines in the plant. Goods are sold direct. They are in the market for some minor machinery items.

Enlargements and Improvements.

—*Illinois, Kankakee. The Paramount Knitting Company, of Chicago, Ill., will erect a new building, 145x60 feet, at this place. Contract has been let for construction of the building.

—New York, Fort Plain. An addition is being built to the Bailey Knitting Mills.

—Pennsylvania, Birdsboro. A two-story wooden addition is to be built to the Smith & Ross hosiery mill. Concern manufactures men's half hose.

—Pennsylvania, Schuylkill Haven. Reed & Leininger, manufacturers of ladies' ribbed underwear, have recently completed erection of an addition in which they have installed a bleaching and dyeing department. They have also added two large knitting frames and machines for finishing.

—Virginia, Norfolk. An addition 40 by 52 feet is to be erected to the Norfolk Mill, C. Brooks Johnston, proprietor. New machinery will be installed.

Mills Starting Up.

—*Michigan, Pontiac. The Pontiac Knitting Co. has been organized with a capital stock of $50,000, to operate the plant of the Pontiac Knitting Works Company, and will start operations in the plant shortly. Elmer R. Webster is president of the new concern and Frank G. Jacobs, secretary and treasurer. A. Partello will be superintendent and manager of the mill.

—*Wisconsin, Menasha. The Fox River Valley Knitting Company, whose plant at Appleton, Wis., has been burned, will locate the mill at this place. A building has been purchased and they will start operations in two weeks. Men's woolen hosiery, lumbermen's socks and mitts are made. They will operate 75 knitting machines and 4 sewing machines. Are in the market for a 7-inch Higginbotham ribber.

Mills Shutting Down.

—*New Hampshire, Manchester. The plant of the A. P. Olzendam Hosiery Co. has been closed and will probably not resume operations under old management. The embarrassment of the company is more serious than was at first thought. The entire liabilities are reported as near $200,000.

Silk.

New Mills.

—New Jersey, West New York. The Pallisade Silk Company has been incorporated with a capital stock of $100,000 by O. De Forest, Harriet De Forest, C. Lawrence Martin (Summit, N. J.), and Francis J. Rue (Pelham, N. Y.) They propose manufacturing all kinds of silks.

—*Pennsylvania, Philadelphia. The new mill to be started here about July 1st, by Samuel S. Fretz, will be incorporated about January, 1903, as the Samuel S. Fretz Company. Umbrella silks will be made, the mill to have an equipment of 60 looms, using steam and electric power. I. W. Gross will be superintendent. They will sell direct.

—Pennsylvania, Scranton. A site has been purchased at West Scranton, upon which a large silk mill is to be erected by W. H. Ashley, of Hackettstown, N. J. A company is to be formed to operate the plant. It is proposed having the building completed and ready to start production of goods in about three months.

—Pennsylvania, So. Bethlehem. The Lehigh Valley Silk Mills will erect a branch plant in Lauferville, near this place.

Enlargements and Improvements.

—North Carolina, Fayetteville. The Ashley-Bailey Co. will start work during June on the new silk mill to be built. The new plant will be equipped with weaving machinery.

—Pennsylvania, Reading. Knoll & Althouse are making improvements and additions to their dye house. A new boiler house, 20 by 15 feet, brick, one story, is under construction. Other alterations will be made and new machinery added.

Mills Shutting Down.

—Pennsylvania, New Holland. The new Holland Silk Mill has been obliged to discontinue operations for a time on account of strike at Paterson, N. J., where firm has the dyeing done.

Miscellaneous.

New Mills.

—*Connecticut, Torrington. The Belfast Mesh Underwear Company, reported incorporated, with capital stock of $80,000, will operate a plant at this place, making linen underwear. W. H. Dayton is president of the company, and Geo. W. Greene, treasurer and agent. They expect starting operations in fall of 1902.

—*Massachusetts, Millbury. The Holbrook Manufacturing Company, previously reported to operate the Rhodes Warp Mill at this place, will have an equipment of 50 looms for manufacturing cloth. In addition to officers reported, E. F. Rice will be superintendent of the plant.

—Pennsylvania, Reading. The Sanitary Dye Company has been incorporated recently and started operations at this place. Concern makes a specialty of dyeing hosiery.

—Rhode Island, Pawtucket. The Ingrahamville Dye Works are equipping a plant on the site formerly occupied by the Charlton Manufacturing Company, which was destroyed by fire two years ago. They will dye and bleach. William Halliwell is manager of the new company.

Enlargements and Improvements.

—*Pennsylvania, Philadelphia. The Schwarzwaelder Co. write us that they are rebuilding the plant recently damaged by fire and will be ready to occupy same about August 1st. The loss was placed at $40,000, fully covered by insuraance. Temporary quarters are now at 221-225 New St.

Fires.

—Ontario, Almonte. The Anchor Knitting Company's storehouse has been destroyed by fire. The loss is placed at about $20,000.

Failures and Suspensions.

—Connecticut, Norwich. Otto E. Wulf of this place has been appointed receiver of the Owaneco Silk Company's plant, upon petition made by J. Hunt Smith, a stockholder and creditor for $17,000. The liabilities are estimated at about $150,000. The assets are stated to be nominally slightly more than the liabilities if they could be sold in a regular way.

—New York, Rossman. The Rossman Knitting Company is reported in financial difficulties and a committee has been appointed by the creditors to investigate the standing of the firm. Company is willing to accede to any plan made by the creditors.

—West Virginia, Morgantown. The Monongahela Textile Company has gone into the hands of receivers, Frank Cox and J. C. Frazier. Full power has been given the receivers to operate the plant. Company's liabilities are estimated at $100,000, with assets about $90,000. The Bank of the Monongahela Valley is creditor to the amount of $25,000.

Facts and Gossip.

—Delaware, Townsend. Samuel R. Davidson of Wilmington is interested in the project on foot for establishing a silk mill at this place.

—*Georgia, Carrollton. The consolidation of the Carrollton Oil Mills and the Mandeville Cotton Mills has been perfected. Have not decided upon any improvements.

—Georgia, Tallapoosa. At a meeting held recently by the stockholders of the Tallapoosa Cotton Mill Co., it was voted to abandon the project of establishing a new plant. The erection of this plant has been under contemplation for some time.

—Maine, Augusta. The Standard Braiding Company has been incorporated at this place with capital stock of $500,000, to manufacture braids and laces. Jas. Williamson, Jr., is president of the company and J. Berry, treasurer.

—Massachusetts, Blackstone. It is reported that about 75 looms are to be taken out of the Saranac Mills, 25 to be removed to the Ray Mills of the American Woolen Co., at Franklin, Mass., and 50 to the Assabet Mill, Maynard.

—*Massachusetts, Farnumsville. A. F. Knight of Woonsocket, R. I., has purchased the plant of the Farnumsville Cotton Mills, from the Woonsocket Institution for Savings. Nothing has yet been decided upon as what will be done with the property.

—Massachusetts, South Hadley Falls. It is reported that plans are under way for transforming the Glasgow Mill property into a thread mill and that capital stock is being raised for this purpose. If the plan is not successful the property will be sold at auction. This is the mill which is in the hands of C. F. Smith and W. R. Hill, receivers.

—*Massachusetts, Spencer. Simon Taylor is now proprietor of the mill formerly operated by Beebe, Webber & Co., having taken possession May 1st. Thos. F. Cregan is superintendent of the mill, which makes medium fancy cassimeres, on commission for Beebe, Webber & Co., operating 3 sets cards and 17 looms.

—*Massachusetts, Walpole. James B. Lewis, manufacturer and dealer in cotton waste, informs us that he contem-

plates starting operations again, June 1st, in the plant recently damaged by fire.

—New York, Batavia. It is reported that James Wilson of Warsaw and Thomas S. Glover are interested in forming a company with capital stock of $50,000 and establish a knitting mill at this place.

—New York, Homer. It is reported that a knitting mill is to be established in the old tub factory at this place.

—New York, Syracuse. The Syracuse Hosiery & Underwear Company has been incorporated with capital stock of $40,000 by E. Devine, R. H. Joy and J. J. Ryan.

—New York, New York. A mortgage of $200,000 has been given to the Manhattan Trust Company, as trustee, by William Wicke Ribbon Co., on the entire plant, to secure an issue of 200 twenty-year 6 per cent. gold bonds of $1000 each, from April 2, 1902.

—*North Carolina, Fayetteville. The court has declined to confirm the recent sale of the Fayetteville Cotton Mill, which was bid in for the bondholders by R. T. Gray of Raleigh. The plant will be resold on June 19.

—North Carolina, Graham. The Oberon Mill Company has been incorporated with capital stock of $200,000 by C. S. Parish of St. Joseph, Mo., G. V. Fraker of St. Louis, and J. V. Pomeroy of this place. They propose manufacturing cotton goods.

—North Carolina, Raleigh. The new textile building of the A. & M. College at tihs place will not be put in operation until the beginning of the next term, September, on account of not having received the electric motors and other power equipment.

—North Carolina, Hilderbran. The Henry River Mfg. Co. is reported as incorporated with capital stock of $65,000, to manufacture cotton and woolen goods.

—North Carolina, Oxford. A new knitting mill is projected at this place. H. M. Shaw is among those interested.

—North Carolina, Wentworth. A. J. Whittemore is mentioned as contemplating the establishment of a knitting mill here and will remodel an old mill building for the purpose.

—*Ohio, Cleveland. The Pearl Street Savings & Banking Co. purchased the F. Muhlhauser Co.'s plant at referee's sale for $162,000. The proceeds will about pay the preferred creditors. The general creditors are reported to get nothing.

—*Pennsylvania, Philadelphia. The plant of the Phoenix Mills Co. was sold at auction May 27, to a syndicate formed by Samuel Dickson, for $65,000.

—Pennsylvania, Philadelphia. The entire plant of the Frankford Finishing Works, Taylor & Scott, proprietors, has been purchased by a syndicate, which will operate same as the Octoraro Linen Finishing Company. Table linen, towels, crashes, etc., will be finished.

—Pennsylvania, Wernersville. The small knitting mill at this place, for manufacturing half hose, operated by J. Ulysses Hain, is for sale.

—Pennsylvania, Darby. The plant of the Griswold Manufacturing Company, whose charter has expired and which has been in liquidation for some time, is to be sold. The plant consists of two mills, one for making worsted goods and which is in steady operation, and another for manufacturing silk, the latter not in operation for some time.

—Pennsylvania, Derry Church. It is reported that a hosiery mill is to be erected at this place.

—*Pennsylvania, Derry Church. We have been advised by John M. Strickler that a hosiery mill was proposed at this place, and that foundation for the building had been put in, but project abandoned.

—*Rhode Island, Chepachet. Samuel Meller was erroneously reported as to operate the looms in the mill at this place. We learn that it is Abraham Mellor, a brother of Mr. Mellor, who is the interested party.

—*Rhode Island, Bridgeton. It is reported that O. T. Inman and F. A. Inman are to erect a new mill for manufacturing yarns, on site of the mill burned in 1897.

Rhode Island, Chepachet. Samuel Meller, whose plant at Pascoag has been destroyed by fire, is reported to operate the looms in the mill at this place.

—Rhode Island, Pawtucket. Robert Burgess has been elected treasurer and general manager of the Slater Cotton Company, succeeding Crawford E. Lindsey. Mr. Burgess has been connected with the Grinnell Manufacturing Co., of New Bedford.

—South Carolina, Laurens. The Ware Shoals Manufacturing Company contemplates erecting a cotton mill, with about 25,000 spindles, at water power site on the Saluda River. About half the capital stock necessary for the project ($500,000) has already been subscribed. W. B. Smith Whaley Co. will be engineers in charge of the mill.

—South Carolina, Westminster. The erection of a $40,000 knitting mill is under contemplation by W. P. Anderson.

—South Carolina, Anderson. Work has been started on soliciting subscriptions for the $400,000 cotton mill projected at this place. J. A. Brock and R. E. Ligon are actively interested in the project. It is the purpose of those interested to manufacture fine goods and have the plant located as near the Anderson Mills as possible, so that they can be operated under one management.

—*Tennessee, McMinnville. The directors of the Tennessee Woolen Mills, which were partially destroyed by fire, have decided not to rebuild the plant and will sell the property at public auction, July 16th.

—Tennessee, Knoxville. The Knoxville Knitting Company's property has been purchased by the Knoxville, LaFollette & Jellico Railways for $15,000. The Knitting company has not yet decided upon a new location, but if found adequate, will take space in the addition now being erected for the Knoxville Woolen Mills.

PERSONAL RECORD.

Cotton.

—William S. Anthony, lately assistant master mechanic in the Aspinook Co.'s mill, Jewett City, Conn., has resigned to become master mechanic of the Sterling, Conn., branch of the United States Finishing Co.

—Reuben A. Barber, for the past 36 years superintendent of the mills of the Dexter Yarn Company, Pawtucket, R. I., resigned recently and is succeeded by Winifred D. Barber, a son of Varnum T. Barber, superintendent of the mills of the Slater Cotton Company. The new superintendent, although bearing the same name as the late superintendent, is not related to him. Since leaving the Lowell Textile School, Winifred D. Barber has been connected with the Slater Cotton Co., and is pronounced eminently qualified for the position.

—John L. Burton, formerly of Lawrence, has been appointed agent of the Newmarket Mfg. Co.'s mill, Newmarket, N. H. He has been employed during the last six years as loom expert by the Draper Co., Hopedale.

—S. Blacklock, overseer of dyeing with the Greene & Daniels Mfg. Co., Pawtucket, R. I., has resigned.

—Robert Burgess has become treasurer and general manager of the Slater Cotton Company, Pawtucket, R. I., succeeding Crawford E. Lindsey, who retired some time ago. Mr. Burgess for the past 10 or 12 years has held the position of superintendent at the mills of the Grinnell Mfg. Co., New Bedford, Mass.

—Benjamin F. Foster, Lowell, Mass., has accepted the position of secondhand of warping and spooling with the Otis Company, Ware, Mass.

—Alfred Holmes, formerly of Penacook, N. H., is the new overseer of carding at the Dexter Yarn Co., Pawtucket, R. I.

—Ernest Hall, designer, Everett, Mass., has accepted a position with the Hutchins Narrow Fabric Co., Springfield, Mass.

—T. B. Howard, formerly in the employ of the Eagle & Phenix Mills, Columbus, Ga., is now overseer of spinning with the Dublin Cotton Mills, Dublin, Ga.

—George F. Ivey has accepted the position of superintendent of the Bessemer City Cotton Mills, Bessemer City, N. C. He was formerly superintendent of the E. L. Shufford Mfg. Co., Hickory, N. C.

—Alexander Jennings, overseer of carding at the Bennett Cotton Mills, New Bedford, Mass., has resigned.

—N. B. Kerr, agent of the Boott Cotton Mills, Lowell, Mass., sails for Europe this month, returning some time in July, when he will take charge of the new Butler Mill, as treasurer. Ariel C. Thomas, superintendent of the Saratoga Victory Mill, Victory, N. Y., and formerly with the Clinton Mill, Woonsocket, R. I., will succeed Mr. Kerr.

—T. W. Lochridge is boss weaver at Monticello, Ark. He was formerly secondhand of the Crown Cotton Mill, Dalton, Ga.

—Ward B. Moody has been promoted from secondhand to overseer of weaving with the Grosvenordale Co., North Grosvenordale, Conn.

—P. J. Miller has resigned as overseer of carding and spinning at Thomson, Ga., to accept the position of assistant overseer of spinning at the Manchester Mill, Macon, Ga.

—Frank W. Millett has accepted the position of overseer of carding at the Hebron Mill, Hebronville, Mass. Mr. Millett was formerly overseer of carding at the Grant Mill, Providence, R. I. He succeeds Charles Prew.

—W. A. Price has accepted the position of superintendent of a mill at Petersburg, Va., resigning his position with the Gibson Mfg. Co., Concord, N. C., in order to take the new place.

—W. S. Porter has resigned the position of oevrseer of weaving at the Overland Cotton Mills, Overland, Colo.

—J. Wesley Pike has been appointed superintendent of the weaving department of the South Chester Manufacturing Co.'s mill at Chester, Pa., operated by Ross & Richardson. Mr. Pike has held the same position at the mills of the Esrey Mfg. Co. for thirty years and is a thoroughly experienced and competent man.

—Edward E. Reed has retired from the employ of the Boott Cotton Mills, Lowell, Mass., after almost 58 years of service for that corporation. He was presented by his old mill associates with a purse of $112.

—Robert Shaul, formerly overseer of spinning in W. C. Plunkett & Sons' mill at Adams, Mass., is now overseer of spinning in the Harmony Mills, Cohoes, N. Y.

—Samuel H. Simester, formerly overseer of spinning in the Wampanoag Mill, Fall River, Mass., has accepted a similar position at the Shove Mill, taking the place of Joseph Burke, resigned.

—Samuel Taylor is the superintendent of the Soule Mill, New Bedford, Mass. Mr. Taylor was born in England, and when 25 years of age was sent to the United States by English manufacturers of machinery to superintend the setting up of English machinery in different cities. In 1896 he became overseer of the Acushnet Mill, New Bedford, Mass., and two years later he was appointed to the same position in the Dartmouth Mill, where he served until last September. Since then he has acted as overseer in the Soule Mill until recently, when he received the appointment of superintendent. Mr. Taylor is exceptionally trained in the work of mill carding rooms, and at the New Bedford Textile School is an instructor in the carding department.

—H. R. Weston, formerly of Kearney, Neb., has taken charge of the Rosalie Mills, Natchez, Tenn., recently bought and improved by the Natchez Cotton Mills Co., and which in future will be operated by that company and be known as Mill No. 2.

—J. W. White, from Macon, Ga., is the new overseer of carding at the mills of the McColl Mfg. Co., McColl, S. C.

Woolen.

—Matthew Allan, late of Warren, Me., has accepted the position of boss spinner with the Grand Forks Woolen Mills, Grand Forks, N. D.

—Justin Ames of Camden, Me., has succeeded Matthew Allan as boss spinner at the woolen mill, Warren, Me.

—Walter Brogden has resigned as overseer of the worsted yarn department at the Clinton Worsted Co.'s Mills, Clinton, Mass.

—J. A. Berryman, superintendent of the Kennebec Worsted Mills, Fairfield, Me., for the past year, has severed his connection with that concern, and gone to Stroudsburg, Pa., to accept a similar position.

—J. S. Clancey has taken charge of the finishing department of the Evansville (Ind.) Woolen Company's mill.

—John Clayton, overseer of spinning at the F. L. Sayles Co.'s mill, Pascoag, R. I., for the past 15 years, has resigned. He has been succeeded by Benj. Allen, formerly overseer of spinning at the Stone Worsted Mill, Pascoag, which was destroyed by fire recently.

—Arthur Dixon has been appointed assistant superintendent of the mill of the Mayo Woolen Co., Millbury, Mass.

—Oliver Dumas, late overseer of spinning and twisting in the Cranston Worsted Mill in Bristol, R. I., has assumed the superintendeacy of the Danielsonville (Conn.) Cotton Mill.

—Thomas J. Davis of Portage, Wis., has engaged with the Manchester Woolen Mills, Manchester, Iowa, as loom fixer and foreman.

—George J. Dunn, West Chelmsford, Mass., is in the employ of the Goodall Worsted Co., Sanford, Me., running a section of worsted spinning.

—Fred Dixon, formerly overseer of finishing at the French River Textile Co., Mechanicsville, Conn., is now with Richard Waterhouse & Sons, Greenville, R. I.

—Daniel Firth, of Philadelphia, is the new worsted carder at the Cleveland, O., worsted mill.

—P. J. Fagan of Medway, Mass., is now boss dresser for the Hinsdale Woolen Co., Hinsdale, Mass.

—Charles Green, of Uxbridge, Mass., has accepted the position of superintendent of the Miller's River Mfg. Co.'s plant at Athol, Mass.

—Mark Hanley, formerly overseer of weaving at the Wilton Woolen Co., Wilton, N. H., is now filling a similar position at the Farwell Worsted Mills, Middleboro, Mass.

—Harry B. Harley, son of the late James B. Harley, has been appointed as manager of the American Printing Company at Fall River, Mass., to succeed his father. He has been assistant superintendent four years. Work on the improvements at the plant is rapidly progressing.

—Herman Haigh of Philadelphia has accepted the position of overseer of carding with the Northern Ohio Blanket Mills, Cleveland, O.

—Walter S. Irwin, who recently resigned the position of designer at the Rock Mfg. Co., Rockville, Conn., has accepted the position of superintendent and designer of the Rhode Island Worsted Co.'s new mill at Indian Orchard, Mass.

E. T. Kelly has changed from the Dunn Worsted Mill, Woonsocket, R. I., to the Pequa Mills, 22nd and Spring Garden Sts., Philadelphia, Pa.

—G. W. Kendry, formerly overseer in the mill of the Thomas Kent Mfg. Co., Clifton Heights, Pa., has taken charge of the weaving in the mill of S. F. Cushman & Sons, Monson, Mass.

—William Lacey, formerly designer with the Saxondale Worsted Mills, Bridgeton, R. I., has accepted a similar position with the Putnam (Conn.) Woolen Company.

—William Marshall of Maynard, Mass., is now in the employ of the American Felt Company, Glenville, Conn., as overseer of spinning.

—E. G. Morrison has retired from the firm of Carter & Morrison, woolen manufacturers, Tilton, N. H., and A. D. Carter of Lowell, Mass., is now sole proprietor of the factory known as the Buell Mill, which has been operated by Carter & Morrison during the past few years. Mr. Morrison still retains his interest in the firm of O. & E. G. Morrison in operating the flannel mill and shoddy manufactory, which they established a few years ago.

—Samuel Melbourne is now with the Newburgh (N. Y.) Woolen Mills as boss spinner.

—Charles North has resigned as superintendent of the finishing department at the Hockanum Mills, Rockville, Conn., and has accepted a similar position in a mill in Maine. John Thornton of Agawam, Mass., is his successor.

—Arthur Ormondrand is the new section-hand of spinnig at D. Goff & Sons' mill, Pawtucket, R. I.

—Joseph H. Priestly of Moosup, Conn., has been engaged as boss weaver by the Oldtown, Me., Woolen Company.

—Alfred Patchett, superintendent of the George Shimer & Son Worsted Yarn Mills in Camden, N. J., has resigned, having engaged with Oliver Lupton & Sons, Manayunk, Philadelphia, in a similar capacity. Wallace Bentley, of Philadelphia, will succeed him.

—A. Robinson is the new boss spinner at the Allen Woolen Mill, Rochester, N. Y.

—W. F. Scott has been made superintendent of the mill of Robert Bleakie & Co., Hyde Park, Mass., with P. H. Sheridan as assistant. Mr. Ambach, former superintendent, is to make a trip through Europe.

—George F. Smith, formerly with the Riverside Mills, Stafford Springs, Conn., started in last week as boss carder with the Miller's River Mfg. Co., Athol, Mass.

—H. W. Thayer, formerly of Providence, has resigned his position with the Muskingum Valley Woolen Mfg. Co., Dresden, O., to become overseer of weaving in a new mill in Madisonville, O.

Knit.

—Roy L. Barney, late of Hoosick Falls, N. Y., is now in the knitting department of the Campbell Knitting Mill Co., Elmira, N. Y.

—Thomas Creamer, formerly with the E. Jenckes Mfg. Co., Pawtucket, R. I., is to take charge of a knitting mill in Reading, Pa.

—Howard Dudley, dyer, late of Providence, R. I., is in Napa, Cal.

—Frank E. Daniels, in charge of the mending department at the Sulloway Mills, Franklin Falls, N. H., has been succeeded by Frank Hunt.

—Henry Garant, formerly with the Mathis & Davis Hosiery Mills, East Chattanooga, Tenn., is now with the Athens Hosiery Mills, Athens, Tenn., as superintendent.

—William Grandage, for four years general manager and superintendent of the works of the Samuel Fitch Mfg. Co., Thornton, R. I., has resigned and bought a half interest in the Cooper Mercerizing Company of Providence.

—Gilbert Harris is in charge of French & Ward's knitting and spooling department, Stoughton, Mass., where he has been for the past 16 months.

—Joseph Thackrah, foreman of the dyeing and milling departments of A. V. Morris & Son's mills, Amsterdam, N. Y., since they began color work 18 years ago, has resigned his position with this firm.

Deaths.

—James B. Harley, manager of the American Printing Company, Fall River, Mass., died early last month, aged sixty-eight. He was born in Glasgow. He left home for this country in 1856, and returned again when the panic broke out here. In 1865 he came here again and found work as a color mixer at Globe Village. Later, he went to Lowell, where he became assistant manager at the Hamilton Print Works, under his brother. Together with his brother, he then formed a partnership, and established a small works. Later he was offered the position of manager of the American Printing Company, accepted, and for the past twenty-three years has been with this company. Mr. Harley was the practical man who made the plant such a success. It is reported that he received the largest salary in the textile industry. After the Iron Works Mills were built he began to take an active interest in other local properties, and from time to time he became a large investor. Recently he had bought a controlling interest in the Barnaby Manufacturing Company for his sons, and he was also a large owner in the Chace Mills. He leaves a widow, three sons and a daughter. One of the sons is assistant manager at the Print Works, another is interested in silk weaving in a small plant owned by him, and a third has recently left college.

—John S. Bleakie of Robert Bleakie & Co., woolen manufacturers at Hyde Park, Mass., died at his home in Boston May 20 of pneumonia. The deceased was fifty years old, and long a prominent resident of Hyde Park. He was associated with his brother Robert in the woolen manufacturing business for years.

—John Allen, head of the firm of J. & B. Allen, Philadelphia, hosiery and knit goods manufacturers, died last month. Mr. Allen was a native of Mansfield, Eng., where he was born in 1829. Fourteen years later his father, William Allen, came to this country and established the hosiery business to which the son succeeded. The deceased leaves a widow, two daughters and two sons.

—Herman Jonas, a member of the firm of Jonas Brothers Company, lace importers, Philadelphia, died recently, aged 55 years.

—Henry Wheeler Curtiss of the silk importing firm of Hoeninghaus & Curtiss, died of heart disease recently at his home in New York.

—Charles A. Zinderstine, owner of the Rioner Silk Mill, in South Allentown, Pa., died May 11th from typhoid fever.

—Benjamin Arnold died of pneumonia at his home in East Greenwich, R. I., in the 80th year of his age. Mr. Arnold acquired a reputation as an inventor. Perhaps the best known and most widely used of his inventions is a netting machine for making seines from either cotton or linen material. He was also the inventor of a knitting machine for making shawls, braiding machines, cording machines and various other mechanical devices.

—P. O. Fisher, until recently manager of the Virginia Woolen Mills, Winchester, Va., has deceased. He was 68 years of age.

—Wesley Stoney, formerly a well-known figure in the woolen goods district, died at his home in Cherry Hill, N. J. Mr. Stoney at one time was one of the most important handlers of low grade woolens, being familiarly known as "King of the Satinets." He had charge of a satinet department in the old commission house of Pomeroy & Plummer, and subsequently with John A. Plummer & Co. Together with Mr. Darling, the financial man of John A. Plummer, Mr. Stoney operated a similar department with James Talcott, under the firm name of Stoney & Darling, and later became a manufacturers' agent for several satinet mills.

QUESTIONS AND ANSWERS

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the compositionof yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Determining the Grade of Cotton Cloth.

Editor Textile World:

Do you know of any reliable way to determine the grade of heavy duck?

Ente (237).

The only method of determining accurately the grade of heavy duck, or any other textile fabric is by an analysis of the same. This is rather a complicated process and requires more or less expert knowledge of manufacturing. We think, however, that it is quite feasible for one not acquainted with manufacturing to learn enough of the method of analyzing cloth to determine whether a sample is up to a certain standard or not. Our correspondent's question has suggested the idea to us, and we may in some future issue of the Textile World publish an article upon this subject.

The amount of sizing in goods can readily be determined by weighing before and after thorough washing and drying. The weight of the goods can be learned from a small sample with the aid of a grain scale. The number of threads per inch can be easily counted. The weight and threads per inch are the principal points to be observed, and in fact grades many kinds of plain goods, particularly cotton fabrics.

Holes in Knit Goods.

Editor Textile World:

I have examined the sample of No. 10 cotton yarn submitted by the manufacturer who is having trouble with holes in his knit goods, and, in my opinion, the cause of the difficulty is not in the condition of the yarn. I find the sample to be a good grade of frame spun yarn, and it should run well, for there are no spindle points, twits, etc., such as are often found in mule spun yarn.

The twist is about right for latch needles, but is too hard for spring needles. The speed stated, 58 to 60 turns of a 14-inch cylinder is right. I can imagine no other cause than that the yarn is too coarse or too fine for the gauge frame, which is not stated. There is a limit to the size of yarn that can be handled to good advantage on any particular gauge; when this limit is passed in either direction there will be trouble in the camp.

There may, of course, be other causes for these holes, which only a thorough examination of the machines can disclose. Overseers have often come to me with complaints that the yarn was imperfect, when the whole trouble was with themselves.

If all the frames are making holes it is a strong indication that the yarn may be at fault, but if the holes are being made on only a part of the machinery, then look to the machines without delay.

Old Superintendent.

Printing Carpets.

Editor Textile World:

Can you tell me how the sample enclosed is printed, and with what material? I would also like the address of some concern who will print these goods for me by the yard.

La Grue (231).

The sample received was printed after the goods were woven and probably on a calico printing machine; the material used was a mixture of dye and some kind of starch or gum. The Textile World's Directory gives the names of all the printers in the United States, as well as all other textile manufacturers, and inquiries addressed to a number of the printers whose addresses appear in this Directory will, doubtless, result in finding some one who will do this work by the yard.

Hardening Machines.

Editor Textile World:

Can you inform us of any firm manufacturing hardening machines used in making hair felt?

M. T. O. (243.)

We should be pleased to put any firm manufacturing such a machine in communication with our correspondent. Our impression is that most hardeners of this character are made by felt manufacturers for their own use.

Efficiency of Looms.

Editor Textile World:

What is meant by the efficiency of looms expressed by percentage? We have 50 broad looms running 84 picks per minute on one grade of kerseys woven with 54 picks per inch. Our production

of these goods last week in a running time of 60 hours, was 5718 yards of cloth from the loom. What was the efficiency and how is it calculated?

Misspick (242.)

The percentage of efficiency of looms is the ratio of the actual production of cloth in a given time to a theoretical production based on the assumption that the looms run continuously without any stop whatever during that time. In the case cited by Misspick, each yard of the cloth contains 36 × 54 = 1944 picks of filling. The 50 looms running 84 picks per minute would in 60 hours (3600 minutes) make 3600 × 84 × 50 = 15,120,000 picks. With 1944 picks per yard this would be equal to a production of 7778 yards.

Owing to the unavoidable stops for changing shuttles and warps, repairs, etc., the actual production is always less than this theoretical yardage. The difference varies with the yarn, length of filling, bobbin and quality of the work.

In the week cited by Misspick, his production was 5718 yards, or 73½ per cent. of the theoretical production of 7778 yards. This 73½ per cent. is called the theoretical efficiency and is obtained by dividing the actual by the theoretical yardage.

Knitting Machinery.

Editor Textile World:

Where can I secure knitting machinery to manufacture a fabric like the enclosed samples?

Silk (242.)

Answered by mail.

The Diameter of Yarn.

Editor Textile World:

I have been taught in the textile school that the number of diameters of a textile thread per inch is found by extracting the square root of the yards per pound; thus, No. 20 cotton yarn measures 16,800 yards per pound, the square root of which is 130 nearly, the number of threads of No. 20 cotton that will lie side by side in an inch. Can you give me a similar rule by which to find the diameter in millimeters of yarn numbered according to the international or metric system? I have not been able to calculate it by extracting the square root. What is the practice among French and German designers?

Textile (241.)

The length of an inch, of a yard and the weight of a pound happen to be such that the square root of the number of yards of cotton yarn per pound gives approximately the number of diameters of that thread per inch. The result is only approximate and the rule is of no practical value and is not used in mill work. It serves as a basis for elaborate and useless theories of fabric construction. To enumerate two of the reasons why it is useless:—

Threads never lie parallel in the same plane when in cloth; they are interlaced and sometimes change position with every pick. If applicable to cotton, the rule would not be suited for wool, silk or linen, owing to the varying bulk of these materials, but as a matter of fact it is not applicable to cotton yarn.

As the approximate value of the result depends upon the arbitrary value of the inch, yard and pound, any change in these units of length and weight would destroy the value of the result. It is for this reason that the rule is of no value when used in connection with the metric system and international system of yarn numbering. If one desires to use it with these systems, the shortest method would be to find the length of the yarn in yards per pound by the Textile World's comparative yarn tables, extract the square root and reduce the result to millimeters. Foreign designers using the metric system do not base their calculations for fabric structure on the diameter of the thread.

The construction of fabrics is necessarily based on practice, and cannot be separated from it, owing to the many diverse weaves, materials and sizes of yarn employed and the many special effects desired. Theoretical calculations of fabrics based on the diameter of the yarn will not follow students very far outside of the class room. N. Reiser, a German designer and writer, has endeavored to determine by practical tests the effect of changes in the weave, size of yarn and threads per inch in cloth, and the results are given in his recent work, Die Dichtstellung der Kette. The tests are by no means exhaustive, but open up a line of experiment that might be continued with advantage.

Mesh Underwear.

Editor Textile World:

Can you tell us what kind of knitting machinery is used in making mesh underwear? We would thank you for any information that you can give us in this matter. Mesh (240.)

As you have not sent us a sample of the "mesh" underwear which you want to know about, we cannot tell upon what machine it is made. The underwear that has started the present interest in mesh stitch is the Diemel underwear, which is, we believe, made abroad on warp knitting machines; i. e., a straight machine having a separate thread for each needle. These machines are built in Nottingham

and also in Germany. In this country probably the nearest approach to the Diemel is the so-called Belfast mesh, made by a knitting manufacturer in New York State, on two warp frames, built by a Cohoes concern some time ago, and which we understand are the only ones they ever built. Tompkins Bros. supply an attachment for making open work on circular spring needle cylinders, but it has not been used to any great extent, as the fabric is rather more slazy than is usually required. Some manufacturers make a one and one cut presser fabric, commonly designated as the basket stitch. In this country there is a warp machine built near Gloversville, N. Y., but we are not aware that it is being used for making mesh cloth. It is used for glove lining, so far as known.

Repairs for Looms.

Editor Textile World:

Can you inform us where we can get parts for the narrow Stafford loom. We need some gears that drive the cam shaft. Is this loom built now? We have not seen it advertised in any of the textile papers for a long time.

Radford Mills (239.)

We believe that the repairs for the Stafford loom and parts may be had from S. B. Amidon, Staffordville, Conn., who used to build it, and probably does now.

New Publications.

The Victoria Atlas; W. & A. K. Johnston, Edinburgh and London; Price $5.00.

The second or 1902 edition of this atlas, containing 200 plates brought up to date to correspond with the latest discoveries and changes in the political control throughout the world. In addition to the geographical maps, there are plates showing difference in time, national arms, chart of the heavens and the solar system. A complete index makes it possible to readily locate any place on the maps. The work is in keeping with the high reputation of the publishers. One merit it possesses is its size, 10 in. by 12 1-2 in., which permits of its use at the desk without inconvenience. A copy may be seen at this office, where orders are filled.

American Directory of the Knitting Trade for 1902.

We have received a copy of this handy little volume, which has been published annually for many years and is well known to the trade. Like the 1901 book, it has been carefully revised and brought up to date. Besides the directory of the knitting mills in the United States, Canada and Mexico, it contains a list of jobbers and large retailers who handle knit goods. It is carefully indexed for ready reference and convenient use. It is published by the Textile Record Co. of Philadelphia and Boston. Price, $2.

Mechanical Index. We have received from the Industrial Press, 9-15 Murray Street, New York, a copy of Section A of the Mechanical Index. Section A covers machine tools and metal-working machinery. It will be followed by other sections, covering wood-working machinery, electrical appliances, steam appliances, etc., and when the sectional issues are completed they will all be thoroughly revised and bound together in one book of about 600 pages.

This index is designed to be a complete and carefully classified directory of machinery builders in the lines above mentioned, and Section A indicates that the work has been thoroughly performed. In a reference book of this kind the system of arrangement, and more especially the system of indexing, is the most important feature which contributes to its usefulness, and in this work has been intelligently and comprehensively performed in such a way as to give the user the information he is after quickly.

The Year Book for Colorists and Dyers; Victor Koechl & Co., New York.

This year book contains so much useful information relating to the dye house that no dyer can afford to be without a copy. Part 1 contains a large number of tables; Part 2, a list of technical terms in English, German, French and Spanish; Part 3, a list of patents for 1901, classified under four heads, dyes, dyeing machinery, dyeing processes and miscellaneous; Part 4, notes on processes; Part 5, educational; Part 6, list of dyestuffs, makers and methods; Part 7, miscellaneous notes.

Color Problems, by Emily Noyes Vanderpoel; Longmans, Green & Co., New York and London; price $5.00.

This work is designed to be a practical manual of color and color problems for the use not alone of the student, but of designers, decorators, and all workers having to do with the arrangement and mixing of colors. The authoress has devoted years of study to the subject, and, recognizing the impossibility of conveying the idea of color by the reading matter alone, she has added 117 beautiful colored plates to illustrate the text.

Following is a list of the subjects treated in the eight chapters: Color Blindness; Color Theories; Color Qualities; Contrasts and Complements; Color Harmonies; Historic Color; Nature Color; Special Suggestion.

In addition, there is given in the appendix definitions of the technical terms employed, and a list of books for reference.

The New Americas; by Georges Aubert; Ernest Flammarion, Paris; Price, $2.00.

There is a peculiar interest felt in the description of America by a foreign observer, and this interest is heightened when the writer is intelligent, candid, and a close observer. Georges Aubert is all three in his description of a trip made in 1900 and 1901 through the United States, Mexico, Central America and Cuba. Landing in New York during the presidential campaign of 1900, he gives an account of his impressions of America at such a time; his route then leads to Chicago, whence he turns south, passing through Mexico, then to Yucatan, Cuba and Panama. He then turns northward,

stopping at various points along the Pacific coast, reaches San Francisco and then crosses the continent and ends his visit at New York, where it began. It is a book well worth reading. The text is in French.

A Guide for Instruction in Weaving; by Ivo Kastanek, Prof. in the Bruenn Textile School; Bruenner Monatschrift fuer Textil-Industrie, Bruenn; Price, $2.50.

A very valuable book for either expert, beginner or student. The different weaves are classified, and a short description of each class is given, including weaving draft, sectional drawing of the fabric and a sample of the cloth itself.

The contents are so concisely arranged that the reading matter, weave draft and cloth sample referring to any one class of fabrics are all brought under the eye of the reader so that they aid separately and in combination to explain the subject.

No other treatise on weaving has come to our attention that gives the student so clear an idea of the art in so short a time and with so little difficulty. The text is in German.

The Raw Materials of the Vegetable Kingdom; by Dr. Julius Wiesner; Wilhelm Engelmann, Leipzig.

The ninth part of this elaborate work has recently come from the press and maintains the high standard of preceding issues. The subject of raw materials obtained from roots is concluded. Then follow chapters on the sugar beet, leaves, plants and flowers. The illustrations are of the usual high character corresponding with the reading matter. When completed this work cannot fail to prove a valuable addition to technical literature, classifying, as it does, the various raw materials and their sources of supply in the vegetable kingdom.

Leaf Forms; by C. Behrens; 80 plates folio size; Bruno Hessling, New York; price $16.

This is a collection of facsimile reproductions from nature of 500 leaves in natural color and size of domestic and foreign plants, and is of great value to every designer and decorator. The designs are also adapted for use by teachers in advanced classes of drawing. The work can be ordered through this office.

Figural Composition for Surface Decoration; 20 lithograph plates from original designs by M. Wiegan; Bruno Hessling, New York; price $5.00.

A collection of very serviceable suggestions for gobelins, tapestry, furniture, fabrics and every other purpose where decorative figural work of a truly artistic character is required. The very low price will serve as a further recommendation of this valuable collection, especially adapted for the use of textile and wall paper designers. The work can be ordered through this office.

Modern Surface Ornaments; by H. Frilling; 2 series; Bruno Hessling, New York; price each series, $12.00; or in 8 parts of 6 plates each, $3.00 per part.

A collection of surface ornaments developed from plant and animal forms, and suitable for any kind of flat ornament. There are two series of 24 tinted gelatine plates each, with several hundred designs. These designs will be found useful by designers of textile and other decorative fabrics. The work can be ordered through this office.

Portfolio for Flat Ornamentation; Bruno Hessling, New York; subscription price per volume of 12 numbers, $6.70; post free.

This is a monthly periodical publication devoted to the new art style, and intended chiefly for the use of textile designers and manufacturers. The yearly volumes are issued in quarto size and contain 48 tinted gelatine plates. This valuable publication furnishes to its subscribers for a little more than 50 cents about 20 new and original designs every month. Subscriptions for this magazine can be sent to this office.

Hand Book of Weaving and Cloth Analysis; by Jos. Vinzenz; illustrated; Gerhard Kuehtmann, Dresden; price $7.50.

This elaborate treatise on weaving and cloth analysis furnishes another striking example of the care, industry and intelligence with which German technical works are written. Nearly every month we have occasion to review many valuable books written in French or German and treating of some branch of textile manufacturing. The wealth of material contained in this foreign literature leads one to believe that many of our mill workers would find it profitable to learn to read German or French, or both, that these treasures of knowledge might be made available for them.

The first 103 pages are occupied by the reading matter describing first, the method of analyzing weaves, patterns and fabrics, and then the construction and uses of the various groups of weaves. Then follow seventy-two full page colored plates, on each of which are illustrated a number of chain drafts referred to in the text. The colors are so used as to show at a glance the interlacing of the threads, and are of great value, both to the learner and the expert. Following is a brief abstract of the table of contents: Part I—Analysis, describing method of determining set of warp and filling, weave, pattern, size and twist of yarn, material, color, and weight of the goods. Part II—Foundation weaves, plain twill and satin; color effects. Part III—Derived weaves. Part IV—Combined weaves. Appendix—Numbering yarn and yarn calculation by the metric system; calculation of twist yarn, warp, filling and fabrics.

The colored plates alone, exclusive of the German text, are worth the cost of this book to English readers.

The Origin and Development of Artificial Organic Dyestuffs; by Dr. R. Nietzki; Ferdinand Enke, Stuttgart. Price 50 cents.

This is the seventh issue of the 1902 series of technical pamphlets, which has been published since 1895. Twelve are issued each year. The current number gives in concise form a very good general idea of the subject. The text is in German.

Filipinos and Americans; by Prof. F. Rinne; Gebrueder Jaenecke, Hanover. Price, $1.00.

An account of a two months' visit to the Philippine Islands by a German pro-

fessor. His opinions of conditions there since the advent of the stars and stripes are stated with true German frankness, and can be read with profit by Americans, giving, as it does, what Burns asked for himself, the sight of ourselves as others see us. The book contains many illustrations of scenes in the island. It is written in German and can be ordered through this office.

Seconde Patrie; by Jules Verne; Illustrated; J. Hetzel, Paris; 2 vols. Price, $2.00.

This is a continuation of that charming story, The Swiss Family Robinson, which has delighted and instructed millions of young and old. The original first appeared in French, and Jules Verne has retained the general tone of the old story. A passing ship, stopping at the island for repairs, discovers the Swiss family, and this gives the author an opportunity to bring in new characters the continuity of which is maintained. The reader renews his acquaintance with the father and mother, with the daring Fritz, the studious Ernest, the active Jack and that favorite, Francis. The scenes of their new adventures are in the same island, the population of which has been increased by many new comers. A map of the island will be welcomed among the many illustrations. This edition is in French.

The Meter and International Bureau of Weights and Measures; by Ch. Ed. Guillaume, Gauthier-Villars, Paris. Price, $2.00.

This book, issued by the French Society for the encouragement of national industry, supplements that valuable work by Bigourdan, The Metric System, noticed in our April issue, and which gave a history of the French system of weights and measures.

This treatise by Guillaume presents a view of the technical or scientific side of the question, in a form adapted for those who have neither the time to read nor the scientific training to comprehend the numerous volumes that treat in detail of this phase of the problem.

The author in this work refers to such subjects as the metric convention, the metric laboratories, thermometric studies, measures of length and weight, the length of light waves, etc., which are illustrated by numerous excellent engravings. The text is in French.

The Linen Industry in Silicia; by Dr. Alfred Zimmermann; Schulzesche Hof-Buchhandlung, Oldenburg.

An historical treatise of the linen industry, beginning with its foundation in Silicia and tracing its development down to the present time, and furnishing much information of a statistical and technical character. The text is in German.

Austrian Textile Calendar; Moritz Perles, Wien.

This book in addition to the calendar proper contains much useful information for spinners, weavers, knitters, dyers, printers, bleachers, finishers and textile manufacturers in general. The text is in German.

Business Literature.

Interesting Facts on Humidification. The American Moistening Company, Boston, Mass.

This is a 50-page booklet containing a short article on the subject of air moistening in textile mills, valuable tables pertaining to the same subject, and many strong testimonials from users of the American Moistening Company's system.

Belt Conveyers. The Jeffrey Mfg. Co., Columbus, Ohio.

We have received an illustrated circular from this company, showing the various types of belt conveyers built by them and adapted for many different uses in industrial establishments. Manufacturers who are compelled to transport material and supplies from one portion of their works to another, should secure a copy of this circular, which by means of its illustrations shows how well the work can be done by means of belts.

"Hydro-Carbon" System. Steam Boiler Equipment Co., New York.

A circular describing this system, which has already been illustrated in the Textile World. It contains numerous testimonials from firms using this system in various parts of this country, together with the results of tests made on different types of boilers.

Noiseless Pinions; The New Process Raw Hide Co., Syracuse, N. Y.

An illustrated catalogue and price list of the raw hide gears manufactured by this firm and which have been so extensively adopted owing to their noiselessness, durability and economy.

New Color Cards.

Cassella Color Co., New York. Diamine Brown R. This card shows sixteen samples of cotton yarn, loose cotton and cotton cloth dyed with various shades of Diamine Brown R. Full directions and formulas are given.

Pryol Black B and Pryol Brown G. C. Bischoff & Co., New York. This card shows seven shades of gray and fourteen shades of drab on bleached Maco yarn dyed with the above named colors. Full particulars are given in English, French and German.

Fasionable Melange Shades. Farbenfabriken of Elberfeld Co., New York, N. Y. A card containing numerous samples of wool mixtures, for which dyeing directions, formulas and color proportions are given.

Chrome Fast Red G, R and B. Berlin Aniline Works, New York, N. Y. This card shows fifteen samples of worsted yarn and slubbing colored with Chrome Fast Red G, R and B. Full directions accompany the same.

Indocyanine B. Pat. Berlin Aniline Works, New York, N. Y. A sample card showing three samples of worsted slubbing; two are vigoureux mixtures printed with Indocyanine B, while the third one is a solid color dyed with the same stuff.

Zambesi Black V. Berlin Aniline Works, New York, N. Y. This card shows two samples, one of cotton yarn and the other cotton cloth dyed black with 6 per cent. of Zambesi Black V.

Benzidine Colors on Cotton Cloth. Farbenfabriken of Elberfeld Co., New York. 144 samples dyed with Benzidine colors are shown on this card, and full directions and formulas are given for producing the same.

Victor Koechl & Co. Open a New Southern Store.

Messrs. Victor Koechl & Co. Inc., manufacturers of anilines, dyestuffs, colors and chemicals, whose main offices are at 122 Hudson St., New York, with branches at Boston, Philadelphia, Providence and Chicago, have recently opened a new branch office where their large Southern business can be more promptly attended to. It is located at 208 South Tryon St., Charlotte, N. C., and will be managed by Julius Leisel, assisted by J. Worth McAlister. A full line of samples will be carried, and the office will be equipped with every facility for matching shades and samples and giving prompt attention to Southern business.

Gold Medal at Charleston Exposition.

A gold medal has been awarded to the Woodstock Hardwood & Spool Mfg. Co., for their exhibit, consisting of spools, bobbins and other articles of wood adapted for use in the textile industry, at the Charleston Exposition, and to which reference is made in another part of this issue.

Wool Scouring.

In a lecture recently delivered in Leeds, John Dawson, of Rochdale, stated that the English and Continental systems of wool scouring were totally different from each other. On the Continent they did everything possible to keep down the temperature in scouring, thereby obviating the overheating, which caused so much loss to manipulators of wool in this country. It not only effected a great saving in material, but also contributed to the bettering of the condition of the wool.

Another great advantage, which they on the Continent had over British manufacturers, was that they made the by-products from the waste material a marketable value to a much greater extent. Some of the manufacturers in England collected a little of the animal grease, but very few collected the potash. On the Continent they gathered both, utilizing them to considerable commercial advantage. The lecturer did not consider that the Continental wool-scouring machinery was superior to the English.

Location Wanted for a Knitting Mill.

M. Neiman's Sons, Harlem Knitting Mills, 124th Street and Columbus Avenue, New York, are seeking a location in a smaller place, and would be glad to hear from any town that has inducements to offer.

Removal Notice.

Spon & Chamberlain, the well-known publishers and importers of books on engineering and the industrial arts, who have been at 12 Cortlandt Street for the past fifteen years, have moved into more convenient quarters in the Liberty building, 123 Liberty Street, New York City.

Sizing and Softening Materials.

The Arabol Mfg. Co., New York City, make a specialty of pastes, gums, starches, sizings, soluble softening oils and similar materials for manufacturing purposes. They have carefully studied the peculiar wants of manufacturers and their goods are compounded to meet the various requirements of the textile, leather, printing, binding, paper box, paper hanging, painting and laundry industries.

This firm has acquired an enviable reputation owing to the fact that each compound is made to meet the conditions under which it is used, which vary with the work, climate, water, etc.

Medal for the Universal Winding System at Charleston.

A gold medal has been awarded to the Universal Winding Company of this city for its exhibit at the Charleston, S. C., exposition. This is one of several such recognitions of the superior merit of this system of winding, including the highest awards at Chicago, Buffalo and Paris. Through the energy of its managers, the company has installed its machines in every civilized country where textile fabrics are woven or yarns spun. Large orders are now being filled for English and Continental mills as well as for those in this country.

Announcement.

The management of the American School of Correspondence, Boston, Mass., and that of the Armour Institute of Technology, Chicago, Ill., have found it wise and desirable to co-operate in providing technical education by correspondence in harmony with the best laboratory and resident school methods.

Dr. Frank W. Gunsaulus, President of the Armour Institute of Technology, is the head of the Advisory Board of the American School, and the faculty of the Armour Institute is associated with the faculty of the American School in the instruction of American School students.

All examination papers from students in the vicinity of Chicago go directly to the faculty of the Armour Institute for correction and criticism, and American School students will receive full credit toward a degree in the Armour Institute for all work done in the American School.

The work done by the students by correspondence in accordance with this arrangement will be duly accepted and credited at the Armour Institute of Technology, when students desire to complete their course by actual residence here. The instruction papers and meth-

ods of the American School of Correspondence have been examined by the members of the faculty above mentioned and have been approved.

A Ring Overlooker in an English Mill.

A correspondent in the Cotton Factory Times, Manchester, Eng., describes the conditions under which he is working as follows:

"I have 16 frames with 4624 spindles in all, and the spinners are paid standing wages. The overlooker is paid by the hanks turned off by the indicator. Now for $6.44 a week, I have to turn 10,000 pounds of yarn off. I work out my own calculations and have to take charge of my own hands and spinning, to do all my own altering and jobbing, to be the oiler and banding repairer. If I have a frame broken down, I have to pull it to pieces, and all the while the frame is stopped, I receive no pay from that frame, and if a spinner is off, her frames are stopped, so I receive no wages in this instance. If the tin rollers have to come out I have to pull them out, and when they come back I have to put them in, and yet I receive not a cent. If I put them in during overtime I get 8 cents an hour. The strips are 83 feet long. I have to do all the cleaning in the meal hours and look after the strips, and must have all going a full week to enable me to earn $6.44; all meal hours are booked in this. If you have to change your counts from fine to coarse, which you have to change your roving, the spinners know you are on piecework and will not do anything if they can help it, so you stop that frame, and you have to strip it and put the rovings in to change the travelers, to alter all the gearing, and have it stopped about five hours; you receive nothing and you find this reduces your wages at week-end. The doffers have not time to help you, for if I must take the doffers I should lose more with having the others stopped. The counts are all paid by one standard, coarse or fine. If you have two frames stopped a week you lose 3s., and it does not matter if they are stopped through the firm's fault."

—Universal Cotton Jacket. The Boston Belting Company, Boston, Mass., have issued a booklet containing price-list and description of their cotton jacket for covering rubber hose, which is described in this issue under New Machinery and Processes.

—Economical Steam Boiler Appliances. The Williams Gauge Co., Pittsburg, Pa., have issued a folder describing the various devices manufactured by them for steam boilers, and particularly their automatic water feed, which keeps the water at a uniform level, and thus avoids the danger and waste of fuel due to the irregularities of hand feeding.

A New Starch.

Up to within three years, the only starches known were corn starch, potato starch and wheat starch. About three years ago a company was organized to manufacture cassava starch. The advantage of cassava starch is its superior strength and the very smooth finish which it gives. These facts, coupled with the energy and ability of their selling agents, Henry A. Elwell & Co., Philadelphia, led to a wide sale of the starch, which proved satisfactory where used, and the new product has been an undoubted success. The sales have increased to such an extent that the company has been obliged to double the capacity of its factory, and even with these increased facilities, is taxed to its utmost to fill orders. From present appearance, it looks as if this new starch would be an important factor in this branch of business. Textile manufacturers and finishers who are not familiar with this new product may obtain full information from the selling agents.

Problems in Drying.

The enterprising builder of machinery today is not content to wait for the manufacturer to realize the need of his goods. He studies the practical conditions of mill work and seeks to improve them.

Oftentimes a manufacturer himself may not be aware of the possibilities of his machinery.

An illustration of remarkable improvement in cloth drying was recently brought to our attention where two Berry wheels intelligently applied increased the production of the dryer from four 65-yd. cuts of 8-oz. goods per hour, to ten cuts in the same time.

The dryer was horizontal and of an engine driven type, and with the proper arrangement of the fans, which are of the special type of the Berry wheel manufactured for drying purposes, full circulation was induced with the increased results noted above; not only that, but the condensation in the steam pipes of the dryer, under the new system is only one-fifth that of the old system in the same length of time, the steam pressure remaining the same.

This mill now takes the wet 8-oz. cloth from the extractor, puts it through the dryer, and in five minutes a whole cut is thoroughly dried. Carbonizing takes five minutes longer.

This is perhaps an unusual case, and certainly is very interesting, but Mr. A. Hun Berry, 23 West First street, Boston, Mass., is always pleased to give assistance in such problems as are constantly arising in manufacturers' experience.

A Process of Waterproofing.

The goods are passed through two solutions, the cloth being in contact with the solutions for a sufficient time to allow of a thorough impregnation. To prepare the first solution, certain fatty acids are saponified with caustic potash and water in any steam-jacketed boiler or soap-pan. The mixture is then boiled, say, for an hour, sodium silicate and paraffin-wax being added and the boiling being further continued, say, for another hour. The following proportions of the different substances have been found to give the most advantageous results: stearic acid, thirteen parts; oleic acid, six parts; paraffin-wax, eighteen parts; caustic potash, 2.5 parts; sodium silicate, two parts; water, four hundred parts.

The second or fixative solution con-

sists, preferably, of a clear solution of acetate of alumina and is prepared by dissolving sulphate of alumina in boiling water and adding thereto an aqueous solution of acetate of lead. Forty-seven pounds of sulphate of alumina are dissolved in fifteen gallons of boiling water in one vessel and thirty-two pounds of lead acetate are dissolved in fifteen gallons of water in another. When dissolved, the solutions are thoroughly well mixed, the insoluble precipitate of lead sulphate is allowed to settle, and the clear solution of acetate of alumina is decanted off.

Reduction in Price.

The Draper Company, Hopedale, Mass., announce that they have reduced the price of the Speakman patent lever screw from 6 cents to 4 cents per spindle, the quality and workmanship remaining the same.

The advantages of this simple device are out of all proportion to its cost. Every fixer of cotton spinning and roving frames knows how frequently the back weight levers get out of order, and what a trouble it is to put them in repair. With the ordinary screw, two to four ends must be stopped, the back weight taken off, the lever removed, and the screw turned as near the proper adjustment as possible. The production on these rolls is stopped during the operation, the back weights are liable to drop on the cylinder or bands, and the lever, which is ordinarily used to turn the screw, not being designed as a screw driver, is liable to become bent, while the stirrup often falls between the rolls, causing serious damage.

The Speakman lever screw consists of a threaded sleeve, in which the wire hook is fastened by a projection at each end. By turning the screw with an ordinary wrench the hook is carried along with the screw, although not revolving. In adjusting, all that is necessary is to turn the screw slightly without stopping an end or moving a piece. With the old screw, half a turn is the least that can be made, while with the Speakman as much or as little rotation as is necessary may be obtained.

—Overlock Machine. The Willcox & Gibbs Sewing Machine Company, 658 Broadway, New York, have issued a folder showing by means of half-tone illustrations a few of the uses to which their overlock machine is put; among which may be mentioned: ornamental edging largely used in the manufacture of flannelette, domet, petticoats, etc.; lace insertion; velvet overedging; felt overedging; horsehair overedging; corded striping; tuck overedging; overedging combined with shell scalloping; and lace seaming.

Jacob K. Altemus.

Thirty-seven years ago the firm of W. W. Altemus & Son was formed, and for thirty-five years Mr. Jacob K. Altemus has been continuously identified with this business established by his father. For years he has been the only active member of the firm, and, recently, a change in the partnership has placed him in full control of the business, which he will in future conduct under his own name.

Beginning as an apprentice in the shop, the present owner has worked his way through the other branches of the business. He has combined a natural mechanical ability with an inventive talent, the results of which are shown in the many mechanical improvements brought out by this firm during its career.

A full line of spooling, winding, warping and beaming machinery is built, and the shop has been very busy filling the many orders received. Their 1901 pattern of winder for shuttle bobbins, with patent variable motion, has been especially successful. This winds from below and from 90 inch skeins direct to shuttle bobbins, winding yarn very hard, running at high speed and giving a large production.

He has also shown marked ability as an executive officer and financier, and the trade can, therefore, rest assured that the business of the new firm will be conducted in the same efficient manner as before.

Mr. Altemus anticipates in the near future the construction of a number of high grade textile machine specialties not now included in his line.

The business will be conducted at the same location occupied for the last nineteen years, i. e., 2824 N. Fourth St., Philadelphia, Pa.

Sprinkler Contracts.

The International Sprinkler Co., whose main office and works are located in Philadelphia, have recently closed contracts with the following firms to sprinkle their buildings:

B. F. Keith's New Theatre, Philadelphia, Pa.; Jacob Miller Sons & Co., Philadelphia, Pa.; S. S. White Dental Mfg. Co., Philadelphia, Pa.; Otto Gas Engine Co., Philadelphia, Pa.; Hensel-Colloday Co., Philadelphia, Pa.; Gustac Berger, Philadelphia, Pa.; Penn Steel Casting & Machine Co., Chester, Pa.; H. F. Watson & Co., Erie, Pa.; Ansonia Brass & Copper Co., Ansonia, Conn.; Coe Brass Mfg. Co., Ansonia, Conn.; Coe Brass Mfg. Co., Torrington, Conn.; Botany Worsted Mills, Passaic, N. J.; Lehigh Valley Silk Mills, South Bethlehem, Pa.; Bloomsburg Silk Mills, Bloomsburg, Pa.; Benedict & Burnham Co., Waterbury, Conn.; Johnson & Johnson, New Brunswick, N. J.

The Evans Dry Pipe Valve, made by the above company, has been approved by all stock insurance boards and companies, and is widely accepted by the New England Mutual Fire Insurance Companies. It is claimed to be the best dry pipe valve now on the market. Electrical alarms or mechanical water motor alarms—either or both—can be furnished with these valves. Alarm valves are also supplied of approved type. Broad patents not in litigation cover these devices.

Slashers.

The Cohoes Foundry & Machine Co. at Cohoes, N. Y., have been booking many orders for their slashing machinery of late. The order for all the slashing machinery for the new Washington Mills at Frics, Va., has been placed with them. Among other recent contracts are the Berkshire Cotton Mfg. Co., Adams, Mass.; Parker Mills, Warren, R. I.;

Loray Mills, Gastonia, N. C.; Olympia Mills, Columbia, S. C.; Golden Belt Mfg. Co., Durham, N. C.; Monaghan Mills Greenville, S. C.; Anderson Cotton Mills, Anderson, S. C.; Cheswell Cotton Mills, Westminster, S. C.; Eatonton Electric Co., Eatonton, Ga.; Tipton Cotton Mills, Covington, Tenn.; Canton Cotton Mills, Canton, Ga.; Neuse River Mills, Raleigh, N. C.; Monarch Cotton Mills, Union, S. C.; Barker Cotton Mills, Mobile, Ala.; Scottdale Mills, Atlanta, Ga.; Abbeville Cotton Mills, Abbeville, S. C.; Columbia Mills Co., Columbia, S. C.; Chicopee Mfg. Co., Chicopee Falls, Mass.; Arkwright Mills, Spartanburg, S. C.; Nokomis Cotton Mills, Lexington, N. C.; Belton Cotton Mills, Belton, Texas; West Cotton Mills, West, Texas; Itasca Cotton Mills, Itasca, Texas; Gibson Mfg. Co., Concord, N. C.; Columbus Mfg. Co., Columbus, Ga.; Pacolet Mfg. Co., New Holland, Ga.; Gonzales Cotton Mills, Gonzales, Texas.

As Beautiful as a Flower.

The North River is beginning to put on its holiday attire so far as the river craft is concerned, and the Steamer Monmouth of the Sandy Hook Route, which goes in service May 5th, is among the first to appear in new dress. The Sandy Hook Route has without exception the finest class of patronage of any line in the world.

This fleet includes the steamers Monmouth, Sandy Hook and St. Johns, and leaves from Pier 8, North River, foot of Rector Street, running to Atlantic Highlands, where trains are met for Coast resorts, including Seabright, Long Branch, Deal, Elberon, Asbury Park, Avon and Pt. Pleasant. The boats are staunch in build, superb in equipment and greyhounds in speed.

The staterooms are rented for the season by men prominent in Wall Street and in political and social life, and their quarters as well as the main salons are elaborately fitted and furnished. Each boat has a finely equipped dining room under the direction of a prominent caterer, and the entire craft is so handled as to make them floating palaces.

The trips are so timed as to be convenient for the banker, broker and business man who desires a home at the Jersey seaside resorts. The management of the New Jersey Central has inaugurated a fire brigade on its North River property in West Street, and complete fire apparatus has been installed.

Another feature this company has recently adopted is the carpeting of the aisles in its Atlantic City, Lakewood, Shore, and main line trains. The new double ended locomotives for suburban work, which are new to this section of the country, have begun to arrive, and are models of strength, assuring speed and schedule time.

Ring Travelers.

The De Haven Manufacturing Company, of Brooklyn, New York, has opened an office at 78 Equitable Bldg., Boston, under the management of E. W. Walker, Esq., where they will carry a full line of their ring spinning and twisting travelers. This company, of which Mr. Hugh De Haven is the sole proprietor, makes a fine line of ring spinning travelers, bronze and composition twisting travelers, and also own the patents for the "Trojan" bale tie and buckle, which has attracted so much attention among mill men since its introduction, on account of the saving it effects over sisal and the neatness and compactness of the bales put up with it.

They have been making ring travelers for about three years, but have confined their effort mainly to the Southern mills where their goods have met with such success that they have been obliged to enlarge their plant, which is one of the most complete of its kind in the country.

The De Haven travelers are made by a process entirely the result of personal investigation of the conditions under which the traveler is used, and all their goods are guaranteed by them correct in every particular. With increased facilities for manufacturing these articles and their ability to supply the needs of the trade promptly from the Boston branch, they are now in a position to meet the demands of the New England mills. The Trojan bale tie is shipped direct from Brooklyn. An immense stock of this material as well as the buckles is carried at all times. Mills which have not yet used this tie should look into it, as it involves a saving in first cost, time in handling, steamer space and burlap which should not be ignored.

Cotton Fabrics and Yarns in Eastern Turkey.

The U. S. Consul at Harput, Turkey in Asia, writes to the State Department that there is a growing desire in the markets of Harput and the neighborhood for American cotton fabrics. Prints, calicoes, drills, sheetings, etc., of good quality should all find a steady market, as prices now rule. Much dissatisfaction is expressed at the inferior quality of the European cottonades which reach Harput.

There are several local merchants anxious to secure the representation of American houses manufacturing durable goods, and employing fast colors. He advises such houses to send to the commercial exhibit of the consulate samples of fabrics that they have found by experience to be suited to the markets of this part of the Orient, together with agents' rates and conditions. Samples half a yard in length would be sufficient.

While the native weaving of cotton cloth is steadily diminishing, the production is still large enough to consume a considerable amount of yarn. Although the culture of cotton is widespread in Anatolia, but little is spun by machinery outside of Adana. Local looms are supplied with yarn partly from Tarsus and partly from England. Frequent inquiries are made at the consulate as to whether American manufacturers of yarn desire to enter this market. The consul says he would be glad to receive from houses seeking to establish relations with this section agents' rates and conditions, and cards of samples. The colors should be fast and thoroughly reliable. Much disappointment has followed trials with foreign yarns, on ac-

count of the fugitive nature of the dyes employed.

Sample cards with a variety of colors should show clearly the sizes of the different numbers. Details as to the number of skeins in a package, the weight of packages, etc., should be so full that it will be easy to estimate the cost of ocean freight and of land transportation for large shipments.

This consulate will gladly facilitate in every way the entrance of our cotton products into this region.

Gang Sewing Machines.

L. F. Fales, Walpole, Mass., is extremely busy and has sent in the last few months a large special sewing machine with twelve needles, designed to sew material 100 inches wide and one inch thick and making a stitch one and a half inches long, to the Union Fibre Co., Winona, Minn. He has built three complete sets of machinery for Julius Delong & Co., of Alleghany, Pa., each set including a 9-needle sewing machine, folders and a machine for spreading their material, and has just completed and sent to Canada a 100 inch sewing machine with twenty-two needles for horse blanket work.

The trade in this class of machinery seems to be lively and the outlook in Canada is extremely so. Besides this, Mr. Fales' works are very busy on other kinds of work. The plant is now being enlarged to double its former capacity.

Spinning on the Cop.

One of the features of the recent meeting of the New England Cotton Manufacturers' Association held in Boston, was an exhibit of samples of cops, spun on a ring frame on a thin paper tube instead of a wooden bobbin, the numbers of yarn ranging from 60s to 100s.

These were made at the Grinnell Mills, New Bedford, by an arrangement devised and perfected by Robert Burgess, enabling more than double the amount of yarn to be spun between doffings, and the shuttle cops to last more than twice as long as the bobbins from the same frame.

Tanks and Vats.

An extensive business in the manufacture of cypress tanks is established at Palatka, Florida, by G. M. Davis & Son, who build tanks, tubs, vats, covers and gauges for railroads, water works, tanneries, breweries, distilleries, cotton, woolen, knitting, fibre, paper and pulp mills, gold, silver, copper, coal and phosphate mines, cider and vinegar manufacturers, and for hotels and farm use.

Having the raw material right at hand and with long experience, they have acquired a thorough knowledge of the business. Everyone with any experience very readily realizes the necessity of the careful selection of material, perfect joints and hoops, of the right dimension and strength, properly placed. In order to keep up with the demands of this nature, the factory of this firm is supplied with the latest and most improved machinery for this work. With skilled mechanics and a full selected stock of the various materials, which are required for this purpose, they are prepared to promptly fill orders for anything in their line.

Their tanks can be found from the Atlantic to the Pacific and from Canada to the Gulf. They can also be found in Canada, Cuba, Porto Rico, Mexico, and the South American countries.

They have recently opened a branch office at 26 Cortlandt Street, New York, N. Y., to facilitate the handling of the increasing Eastern and export trade.

Graduating Exercises.

At the graduating exercises of the evening classes of the Lowell Textile School, on Thursday, May 15th, the following students received certificates:—

Three years' course Cotton Spinning: M. H. Kelly, Lowell, Mass.; George E. Schermerhorn, Lowell, Mass.; Irving L. Brainerd, Lawrence, Mass.; Henry Good, Lowell, Mass.; Daniel J. Cremin, Lowell, Mass.; Jonathan Wood, Lowell, Mass.; George E. Dudley, Lowell, Mass.; Charles Lee, Lowell, Mass.

One year course Woolen Spinning: W. R Adams, North Andover, Mass.; E. Burkhart, Lowell, Mass.; F. Donnellan, Lowell, Mass.; F. G. Forrest, Lowell, Mass.; Samuel Rockwell, North Andover Depot, Mass.

Two years' course Worsted Spinning: E. J. Kent, Lawrence, Mass.; C. E. Wilson, Methuen, Mass.; G. H. Wilson, Lawrence, Mass.; D. A. Fortune, Lawrence, Mass.; W. H. Smith, Methuen, Mass.; E. Hoyle, Lowell, Mass.; W. M. Lamont, Andover, Mass.

Three years' course Woolen and Worsted Spinning: E. A. Jonnson, Lawrence, Mass.

Three years' course Design: W. Haigh, Lowell, Mass.; E. E. Leith, Lowell, Mass.; W. Stevenson, North Billerica, Mass.; M. H. Varney, Lowell, Mass.; A. H. Vogt, Lawrence, Mass.; David Walker, Collinsville, Mass.

One year Post Graduate Design Course: W. O. Buzzell, Methuen, Mass.; J. J. Cheetham, Lowell, Mass.; J. Collier, Lowell, Mass.; A. C. Gaunt, Methuen, Mass.

Two years' Weaving Course: R. Barlow, Lowell, Mass.; C. E. Cowdrey, North Billerica, Mass.; T. Ferguson, Lowell, Mass.; J. Hogan, Billerica, Mass.; A. J. Lawliss, Lowell, Mass.; A. Malloy, Lowell, Mass.; R. W. Potter, Lowell, Mass.; T. B. Umpleby, Lowell, Mass.

Two years' Mechanical Engineering Course: H. Binns, Lowell, Mass.; G. P. Bowring, Lowell, Mass.; C. W. Field, Lowell, Mass.; J. Haworth, Lowell, Mass.; C. R. Libby, Lowell, Mass.; T. A. Nugent, Lowell, Mass.; C. F. Osgood, Lowell, Mass.; W. H. Stopherd, Lowell, Mass.

Following is the program of the exercises:—

Music, "On Duty," Rosey, by Lowell Textile School Mandolin Club; address, Trustee William E. Badger, Chairman Board of Aldermen; music, "Waltz Bleue," Margis, by Mandolin Club; address, William W. Crosby, Principal of

the School; presentation of diplomas, President A. G. Cumnock; music, "Creole Belles," Lampe, by Mandolin Club.

Buffalo Forge Company.

The usual brisk demand for goods manufactured by the Buffalo Forge Company, of Buffalo, N. Y., is reported. Among the many contracts recently awarded to them might be mentioned the equipment of the Pensylvania Steel Co.'s forge shop at Philadelphia, Pa., with twenty Buffalo down draft forges, by means of which all smoke and gases are immediately and completely exhausted.

Three large Buffalo Fan System heating plants for the Lake Shore & Michigan Southern Railroad shops, of Collinwood, Ohio, may also be mentioned. This contract consists of the heating and ventilating of the woodworking mill, passenger coach paint shop and the freight car repair shop.

The Bowery Bay Building and Improvement Co., New York City, are to be furnished with a 200 H. P. Horizontal centre crank engine for electric lighting plant. This firm bought the Buffalo Forge Company's engine for which was awarded the gold medal at the Omaha Exposition in 1898, and which has been in active service at their plant since date of purchase. The order just entered calls for the same type engine of a larger horse-power.

The Buffalo Forge Company are also to furnish the Seaboard Reality Co., of New York, N. Y., six 120 H. P. engines and two 35 H. P. engines for the electric light plant of this company.

Liquid Fuel.

The amount of attention bestowed upon this subject by the technical and lay press points to a more general adoption of oil fuel as a substitute for coal and wood fuel. Recently a large party of engineers, representatives of steamship and railway companies, made a trip from Gravesend to Port Victoria to witness the application of liquid fuel burning to the boilers of a large steamship.

The vessel in question was the Clam, one of the Shell line steamers, the property of the Shell Transport and Trading Co., Lim. The vessel was on her way to New York, for which port she sailed after having landed her visitors at Port Victoria.

The Clam is a tank steamer with a carrying capacity of 4500 tons of oil in bulk. She has three ordinary return tube boilers, and has now been running for two years burning liquid fuel only for steam generation the whole time. During that period she has steamed 85,000 miles.

The oil-burning apparatus consists of a steam injector which atomizes the oil and discharges it into the furnace; a firebrick structure being fitted upon which the oil impinges so as to secure complete combustion.

The fact that the Shell Transport and Trading Company now have 18 steamers with liquid fuel working satisfactorily, and four are at present being built, each to carry 11,000 tons, dismisses any lingering suspicion that the recent boom in its future has been solely due to the self advertisement of certain interested companies.

The liquid fuel with the present low rates, increased output and discovery of new oil fields must find its way into many interior markets where hitherto it had not been able to compete with coal and firewood. In regard to the important question of cost, it is stated that oil for burning to raise steam, such as is used by the Shell Transport and Trading Company can be delivered in London at $8.75 per ton, while the price in New York is $6.00 per ton.

The evaporative efficiency of the oil is about 16 lbs. of water made into steam per pound oil burnt. Liquid fuel will be able to compete with coal in price at ports far from coal fields, or where the question of transport is of importance. For instance, the Egyptian railways are now adapting their locomotives for the purpose, and oil can be delivered at Khartoum at a price which is equivalent to coal at $7.50 per ton; whereas coal itself there costs $25.00 a ton.

This, of course, is an extreme case in which the gain in transport gives the liquid fuel an immense advantage; but the difficulty of getting good bunker coal for the East, and the wonderful rapidity with which it deteriorates in hot climates are advantages offered by liquid fuel. Its merits, however, do not rest entirely on the cost of water evaporated in the boiler.

One of the chief difficulties with which the ship owner has to contend in the present day, says a correspondent to the Times, is that of securing capable stokers. The work is so arduous and so repulsive that few men will take to it excepting as a last resource, and the consequence is the stoker is too often a difficult character to deal with. The liquid fuel is, of course, self-stoking. It is calculated that 150 stokers needed on an ocean liner could be replaced by 20 men to carry on the duties of the boiler-rooms.

In storage, liquid fuel offers great advantages. In the first place, it can be carried in spaces that would be quite unfit for coal bunkers, the double bottom or ballast tanks, and fore and after peaks, and in various inaccessible places from which coal could not be brought, but which are readily connected up by the oil pipe. Putting this to one side, however, the actual space occupied is less with oil for a given heating potentiality, the ratio been given as 35 to 90. It is calculated that the saving due to the use of oil fuel on a voyage from New York to London would be 300 tons of cargo space and this would represent, say, £300 per voyage gained. The virtue of cleanliness would be much appreciated on passenger vessels. No smoke is made when the oil is properly burnt, although perfect combustion cannot be always assured. In any case dust and cinders are absent. Unless great care is taken, however, the smell of oil is apt to pervade the ship. That is largely a matter of care and cleanliness. When the combustion is properly effected there is no more smell when burning oil than when using coal.—Kuhlow's.

Irish Poplin.

The American consul at Cork sends a report upon the poplin industry of Ireland, in which it is stated that at present, there is a decided improvement in the trade, due probably to three causes —the active interest taken by the Queen

in the British silk industry, Irish as well as English, the peculiar suitability of the material to the fashions of the day, and the special favor shown it by many of the leading English, French, and American firms, who have lately given large orders.

Like the English silk industry, the Irish poplin trade owes its origin to the revocation of the edict of Nantes and the expulsion of the Huguenots from France. Many of the emigrants settled in Dublin, and the trade still remains in the hands of their descendants. The rule is rigidly enforced that none who have not served a seven years' apprenticeship and who are not the eldest sons of regular tradesmen may work or will be recognized as weavers. This may have much to do with the high class of work produced.

The earnings of the poplin weavers vary a great deal. The average wage is about $6.08 a week, but all depends on the quality of the fabric. They are paid by the yard. For some weaving, the workmen receive as much as 97 cents a yard. To the very best and most experienced hands are given the magnificent heavy gold and silver brocades, and these men receive up to $1.95 a yard for weaving the cloth. The tissue is of pure metal; the weaving requires the highest class work and proceeds very slowly, so that the earnings of these trained artisans often do not exceed $14.60 a week. In weaving with gold and silver, the workman has continually to stop to make sure that the thread lies perfectly flat, the thread being sometimes so fine that it can hardly be felt. In former times, the weavers worked in their own homes, but now the large establishments have their own factories, where the material is stored and given out to the weavers as wanted.

The silk used for poplin is dyed in Dublin, the colors being unrivaled in brilliance. Dublin seems to be the only place where this exquisite fabric can be satisfactorily made. This has been put down to some peculiar quality in the water. Poplin is, as everyone knows, a combination of silk and wool, so woven that the upper and lower surfaces are of the purest silk, while the interior of the material is of wool, thoroughly shrunk before weaving, so that "cockling" is an impossibility.

Considering of what it is composed, this material is wonderfully inexpensive, the prices ranging from 85 cents to $2.43 a yard, while the brocades vary from $1.46 to $4.38 a yard. Gold and silver brocades are not included in this estimate. It is a most economical material, for it outwears all others and looks well to the end.

Poplin is divided into three classes—single, double, and terry. The first two are so much alike that the uninitiated could not tell the difference, which consists in the quality of silk used in the warp; the third is corded and is that class which is mostly associated in the public mind with Irish poplins.

Wm. B. Scaife & Sons Co. Purchase We Fu Go Co.

The water softening and purifying business of the We Fu Go Company, Cincinnati, Ohio, together with all its patents, capital stock, and good will, has been purchased by the Wm. B. Scaife & Sons Company, Pittsburg, Pa.

That steam users at last fully realize the vast saving of fuel and labor, and the increased durability of their boilers, and prevention of disastrous explosions when the scale-forming and corroding ingredients are properly removed before entering the boilers, is certainly evidenced by the fact that Wm. B. Scaife & Sons Co. advise us that their softening and purifying plants in the U. S. alone are now daily treating over 14,000,000 gallons of water.

The numerous plants which they have installed are now to be found in all kinds of steel factories, ice plants, bleacheries, malt houses, textile works, hotels, office buildings, laundries, etc., including nearly every industrial and domestic purpose.

—The American Moistening Company, Boston, Mass., have recently received orders from the following mills for their humidifiers: Gonzales Cotton Mills, Gonzales, Tex.; Jackson Company, Nashua, N. H., repeat; The Lawrence Duck Company, Lawrence, Mass.; The J. B. Whitney Silk Mills, Paterson, N. J.; John N. Stearns & Co., Williamsport, Pa.; Wm. H. Grundy & Co., Bristol, Pa., repeat; Meridian Cotton Mills, Meridian, Miss.; The Nokomis Cotton Mills, Lexington, N. C.; The Newnan Cotton Mills, Newnan, Ga., repeat; The Dublin Cotton Mills, Dublin, Ga.; The Shamokin Silk Company, Shamokin, Pa.; The J. Elwood Lee Co., Conshohocken, Pa.; The Dartmouth Mills, New Bedford, Mass.; The Whitman Mills, New Bedford, Mass.; The Hamilton Manufacturing Co., Lowell, Mass., repeat; The Roswell Cotton Mills, Roswell, Ga.

—The American Moistening Company, Boston, Mass., are receiving many orders for their "Aerophor" Fabric Dampener, as is shown by the following list of firms ordering this machine, a number of which gave repeat orders: Messrs. Jos. Bancroft & Sons Co.; Jordan Manufacturing Company; Manchester Mills; Waldrich Bleachery; Perseverance Worsted Company; Algonquin Printing Co.; Queen Dyeing Company; Swansea Dye Works; Joseph Greer; Pacific Mills; Arnold Print Works; Windsor Company; Parkhill Manufacturing Company; American Printing Company; Barnaby Manufacturing Company; Silver Springs Bleaching & Dyeing Company.

—The Burt Mfg. Co., of Akron, Ohio, report a recent shipment of their Cross Oil Filters to different cities in the far East—India, China, Japan and the Philippine Islands. Other important shipments recently made by this firm went to England, Austria, Belgium, Mexico and Argentine Republic.

—The Clinton Mfg. Co., Woonsocket, R. I., have contracted for a Green Fuel Economizer.

—Rhode Island, Pawtucket. It is reported that the Coats Thread Company's plant may be closed on account of labor strike prevailing at the mill.

IN AND OUT OF THE MILL.

Joseph Marie Jacquard.

(Continued from May.)

Of Jacquard's minor inventions is recorded a machine for making fish nets, for which he was awarded a prize, but beyond that it was of little profit to him. Through the advice of a merchant, M. Pernon by name, he first turned his attention to the improvement of silk looms. An invention which would promote the silk weaving industry by introducing the use of better machinery, would mean fame and fortune to the inventor; it would also better the condition of the weavers who now worked in cramped and unhealthy positions over the clumsy looms.

What perhaps Jacquard did not foresee, if we are to give him credit for humanitarian motives at all, is that many must suffer by loss of work when his contrivance reducing the number of hands at each loom, should come into general use. Or, perhaps, he looked over the heads of his generation and the next, and saw a body of happier, healthier people growing up, the result of working under improved conditions.

At the beginning of Jacquard's career, the loom invented by Vancanson was in use. This machine worked somewhat awkwardly, and Jacquard conceived the idea of bringing the art to perfection and dispensing with the labor of children, as employed at the looms of Vancanson.

His experiments were costly and he failed to introduce his improvements into general use. He was ridiculed by his enemies, pitied by his friends. His two looms were sold for debt and even the household goods went piece by piece for food. His loving wife, ever loyal, patient and hopeful, still encouraged his experiments in the face of failure and misfortune.

At length, when they were reduced to actual want, Jacquard became a laborer at lime burning at Bugey, and his wife found employment in a straw factory. Whether their fortunes improved rapidly, or whether they suffered years of such hardship we do not know, for of Jacquard's life little record is made until we find him fourteen or fifteen years later, enlisted and fighting with the citizens of Lyons, when that city was besieged by the army of the Convention.

The citizens of Lyons, anxious to preserve the city from destruction, rose in a body—gentlemen, priests, manufacturers, workmen—all took up arms. But the city was forced to capitulate, and plunder and execution followed. Jacquard concealed himself for a time in a shop where his wife was then employed.

His son, then a lad of sixteen, enlisted with one of the Republican regiments, and, persuading his father to do likewise, they left the city together to fight with the army Jacquard had been opposing. The son, the hope and pride of his mother and father, fell in battle, mortally wounded, while the father, sick in soul and body, was left to languish in the hospitals. When he finally returned to the dismantled city, it was long before he found his wife, who had been reduced to the direst poverty. She died soon after, from overwork and deprivation, with her last breath encouraging her husband to continue his inventions and to trust to Providence and his own genius.

Aided by his old patron, M. Pernon, Jacquard at last completed a model of his machine, which was placed on exhibition at the Industrial Exhibition of 1800. For this he was awarded a bronze medal. He hastened to protect his invention by patents and, then, with the restlessness peculiar to inventive genius, set about improving it. The result of his later improvements was that where his first machine had dispensed with but one workman at a loom, it now did away with the services of three men and two women.

As this loom was generally adopted, untold numbers of weavers were thrown out of work. His name was hooted by those who wandered in the streets hungry and with their occupation gone. He was called "traitor" by those who had been his fellow workmen. But in time conditions righted themselves, and many were benefited where comparatively few had suffered.

Jacquard shrewdly presented his model to the authorities, who sent it to Paris and called the attention of the Emperor Napoleon to the man who, by lowering the price of handicraft in France, would lessen competition and increase the general demand. Jacquard was installed in the Conversatory of Arts and Trades, in Paris, that he might construct his machine under the best conditions. The discerning eye of Napoleon saw in the invention future benefit to France, and had the Government grant a pension of a thousand crowns to Jacquard, upon condition that he should reserve the benefit of his looms exclusively for his own country. With his own hands, Jacquard, while in the Conversatory, wove a magnificent gown of rich brocade, which he presented to the luxury loving Empress Josephine.

As we see, Jacquard had succeeded, but not, alas! until the evening of his life, when his affections and his hopes lay buried in the graves of his wife and son. Something of melancholy always rested like a shadow on the face of this successful old man, though he took great personal pride in what he had accomplished, and the fame which now was his.

He removed to Oullins, a small town, where he died on the 7th of August, 1834, at the age of eighty-two. He gave somewhat, though not lavishly, to the poor, was devoted to his church, and spent his latter days peacefully, leaving behind him a name famous in the annals of the silk manufacture. A statue was erected in Lyons, in memory of the man who had done so much to benefit the silk industry, the life of his native city.

—Rev. Goodman—Mr. Slick, our Sunday school superintendent, is a tried and trusted employee of yours, is he not?

Banker—He was trusted and he'll be tried, if we're only fortunate enough to catch him.—Philadelphia Press.

A Vindication.

The gentle cow looked sadly round,
Her face suffused with shame;
"For all the ills which now abound,"
Quoth she, "I'm not to blame.

"Good butter of an honest hue,
Built by a rustic dame,
The factory may hide from view,
But I am not to blame.

"The milk takes on an azure tint,
Its taste belies its name;
The cream is but a passing hint,
But I am not to blame.

"And when I am set forth as beef
The prices they proclaim
Become a source of general grief;
But I am not to blame.

"For I have simply done my best
And tried no crooked game.
The human beings did the rest,
And I am not to blame."
—From the Washington Star.

A Sense of Satisfaction.

"I suppose you can claim to have done some good while you were in Congress?"

"I can," answered Senator Sorghum. "I have put my family beyond every possibility of want for several generations."—Washington Star.

Industrious.

Lady—Did you ever try to get work?

Tramp—Yes, ma'am; I got a job for me brother once.—From the Baltimore World.

—Proud father (rushing in excitedly)—"We've got a baby at the house!"

"What? A boy?"

"No."

"A girl?"

"Yes; who told you?"

—Some weavers are always looking for trouble to loom up before them.

Comedy of the Vain Man.

The Vain Man, lying dead so long
'Neath unremembering clover,
Awoke as at a bugle's song
And looked the old world over.

The same old world of joy and strife
And—was this him, or not him?—
Three women he had loved in life
Had married and forgot him!

Some certain words I may not say
He, white and wrathful, mumbled,
For, from the headstone cracked and gray,
His very name had crumbled!

And there, while Spring her flag unfurled
And tossed her blooms about him,
He died again to think the world
Could get along without him!
—From the Atlanta Constitution.

"Love Sonnet of an Office Boy."

The other day a rusty pen got stuck
Away deep in her finger and she held
Her poor, dear little hand up then and yelled
For me to hurry over there and suck
The poison out, and when I went I struck
My toe against the old man's cuspidor
And rolled about eight feet along the floor
Before I knew what happened, blame the luck!

When I set up and looked around at last,
That long-legged, homely clerk was there, and so
He had her finger in his mouth, and oh,
I'll bet you I'd 'a' kicked him if I dast!
I never seen the beat the way things go
When there's a chance for me to stand a show.
—From the Chicago Record-Herald.

To Be Sure.

Patience—Did you hear about that dude fire company?

Patrice—No; what about it?

"Why, they won't have anything but silk hose."—From the Yonkers Statesman.

—Fair patron—See here! You told me a horrid story about the way my husband was acting, and I've found, on investigation, that it is not true. He's just as good as can be.

Fortune teller — Very remarkable, madam, very remarkable. I've told that same story to about 10,000 different women and you are the first one who has made a complaint.—Stray Stories.

Mistakes of Life.

It is a mistake to work when you are not in a fit condition to do so.

To take off heavy underclothing because you have become overheated.

To go to bed late at night and rise at daybreak, and imagine that every hour taken from sleep is an hour gained.

To imagine that if a little work or exercise is good, violent or prolonged exercise is better.

To conclude that the smallest room in

the house is large enough to sleep in.

To sleep exposed to a direct draught at any season, says Woman's Life.

To eat as if you had only a minute in which to finish the meal and to eat without an appetite, or to continue after it has been satisfied to gratify the taste.

To give unnecessary time to a certain established routine of housekeeping when it could be more profitably spent in rest or recreation.

Some of the Old-Time Blue Laws of New England.

The following selections are taken from a collection of the old Colonial Blue Laws, so called, and make interesting reading in these days of individual independence.

The Sunday laws in Massachusetts were unique, and while very strict, had only to be observed from midnight of Saturday to sunset of Sunday, making the shortest observance of the Lord's Day on record. But so much concentrated goodness had to be crowded into that time, and any slip or side step from the narrow path of virtue was punished by such dire penalties, that if spread thin, the good discipline should easily have lasted through the week. The bicyclist and the fisherman would have had a hard time in the good old colony days. Listen to this, ye who go to the green wood on ye Sunday picnic, forgetting to attend church and Sabbath school:—

"Whereas, complainte hath been made to this Courte that dyvers persons within this jurisdiction doe usually absent themselves from church meetings upon the Lord's day, power is therefore given to any two assistants to heare and sensure, either by fine or imprisonment (at their discretion) all misdemeanors of that kind committed by any inhabitant within this jurisdiction, provided they exceeded not the fine of 5 shillings for one offence."

And just listen to this, oh ye smokers:—

"Any p'son or p'sons that shall be found smoaking tobacco on the Lord's day, going too or coming from meetings, within two miles of the meeting house, shall pay 12 pence for every such default to the collonie's use."

This is worse than getting caught with short fish:—

"It is ordered that John Baker be whipped for shooting at fowl on the Sabbath day." (Taken from records of 1630.)

The Old Witchcraft Law.

We suspect that the present lucrative business of hypnotism would not have flourished so blithely in those days.

"Be it enacted, that if any person or persons shall use, practice or exercise any invocation or conjuration of any evil or wicked spirit, or shall consult, covenant with, entertain, employ, feed or reward any evil and wicked spirit, to or for any intent or purpose, or take up any dead man, woman or child, out of his, her or their grave, or any part of any dead person, to be employed and used in any manner of witchcraft, enchantment, charm or sorcery whereby any person shall be killed, destroyed, wasted, or consumed, pined or lamed in his or her body or any part thereof; that then every such offender or offenders, their aiders, abettors and councellors, being of any of the said offences duly and lawfully convicted and attained, shall suffer pains of death as a felon or as felons."

In those days the clairvoyants didn't advertise their business in the "personal" column.

"Be it enacted:—That if any person or persons shall take upon him or them, by witchcraft, enchantment, charm or sorcery, to tell or declare in what place any treasure of gold or silver should or might be found or had in the earth or any secret places; or where goods or things lost or stolen should be found or become; or to the intent to provoke any person to unlawful love; or whereby any cattel or goods of any person shall be destroyed, wasted or impaired, or to hurt or destroy any person in his or her body, although the same be not effected and done; that then all and every such person and persons so offending and being thereof lawfully convicted, shall for the said offence suffer imprisonment by the space of one whole year, without bail or mainprize; and once in every quarter of the said year shall in some shire town stand openly upon the pillory the space of six hours, and there shall openly confess his or her error or offence, which said offence shall be written in capital letters and be placed upon the breast of the said offender. And if any person or persons being once convicted of the same offence, and shall again commit the like offence, and being of any of the said offences the second time lawfully and duly convicted and attained, as is aforesaid, shall suffer pain of death, as a felon or felons."

Interesting to the Knights of Labor.

"It is ordered that maister carpenters, sawers, masons, clapboardryvers, bricklayers, tylars, joyners, wheelwrights, mowers, etc., shall not take above 2 shillings a day, finding themselves dyett, and not above 14 pence a day if they have dyett found them, under the penalty of 5 shillings, both to giver and receiver, for every day that there is more given and received. Also that all other inferior workmen of the said occupations shall have such wages as the constables of said place, and two other inhabitants that they shall chuse, shall appoynt."

This regulation was passed in 1632, and so far as known, never repealed. It would certainly jar the modern fashions:—

"Hereafter no garment shall be made with short sleeves whereby the nakedness of the arm may be discovered in the wearing thereof; and such as have garments already made with short sleeves shall not hereafter weare the same; unless they cover their arms to the wrist with linen, or otherwise; and that hereafter no person whatsoever shall make any garment for women, or any of their sex, with sleeves more than half an ell wide in the widest part thereof, and proportionable for biger or smaller persons."

There are cases where this admonition would be quite unnecessary, even through the week:—

"If any man shall kiss his wife or wife kiss her husband on the Lord's day, the party in fault shall be punished at the discretion of the court of magistrates."—(New Haven Blue Laws, 1656.)

Go Easy—Keep Cool.

You probably get up on your "high horse" too easily. The next time you think you have a grievance, stop and think it over carefully, and be as fair as possible with the other fellow. It may seem impossible to you that you are not always right, but if you are an average person you are probably wrong half the time.

The Mule's "Won't" Power.

"Is you gwine ter let dat mewel do as he please?" asked Uncle Ephraim's wife. "Wha's you' will power?"

"My will power's all right," he answered. "You jes' want ter come out hyar an' measure dis here mewel's won't power."

Visitor—Is there anything new in bathing suits this year?

Seashore storekeeper—Yes, a lot of fresh young girls.—From the Baltimore World.

Turkish Rugs.

It is now not an unfamiliar sight to see an Armenian or Turk seated cross-legged in the windows of the Oriental shops of American cities, weaving or mending rugs. He is always an object of interest, this son of the dreamy East, as, in this unsympathetic climate he plies the trade of his ancestors.

Yet few of us realize that the pattern he is weaving means more than the pleasure it conveys to the eye by harmonious color and form. Those who are wise on the subject of rugs tell us, however, that into the borders and entwining figures, are often woven proverbs, poems and even little stories or fables.

In Turkey, Armenia and Persia, whence most of the finest rugs are imported, whole families devote themselves to rug making, sometimes all working together on one piece. This, in part, accounts for the irregularities and differences in thickness and firmness of the nap often noticeable in a large rug.

Sometimes months will be devoted to the completion of one piece, and when it is marketed, the price received would foot up to about three cents per day for the time employed in its manufacture. Union prices have not yet penetrated into the Orient.

But even the sleepy rug maker is feeling the march of progress. It is a pity that from the standpoint of the connoisseur this should be a detriment rather than an improvement to his art. In bygone days, his dyes were unfading, long years of wear only tending to soften and not to dull their tones. Now he has substituted the aniline dyes for vegetable colorings, which, though they may be beautiful, are not, alas, always a lasting joy.

Then, too, he weaves the largest rugs for the European market no longer by hand. Something is gained in evenness and symmetry, to be sure, but the atmosphere of the far-off Orient is lost; that indescribable charm which came to the possessor of a fine rug in feeling that nowhere, in the wide world, would there be found another exactly the same.

With the introduction of machinery, what is to prevent the Oriental, who is no more free from guile than his brother men in the world of commerce, from reproducing set patterns many times? Each year more modern, aniline-dyed rugs are imported, and genuine, fine antiques become more rare.

The public, becoming generally familiar with the value of the Eastern-made rug, clamors more loudly for it. Here seems a chance for the Armenian and the Turk to bestir themselves, to awake to Western progress, and adopt more generally machine weaving; for the average buyer would scarcely detect the innovation, and only the connoisseur would lament.

Hard Work for the German Princes.

We who must get to desk, workshop or mill on bell time every morning usually think of royalty as living in luxurious idleness. With the thrifty Germans, however, this is not the case, at least while the character of royalty is being formed, before they arrive at man's estate. The German princes are put to farming—not as a pastime, but in real earnest. Not so many years ago the crown prince might have been seen trudging behind a plough or doing "chores" about the farm which has been established for the young scions of royalty. His two younger brothers are now going through the same course. They work seriously at preparing the ground, planting and raising vegetables and fruit. They also keep hens, and their greatest success has been with American prize Wyandottes.

The farmhouse on the place is a typical peasant's abode, and has not been altered or arranged luxuriously for the accommodation of royalty. The entrance leads directly into a whitewashed room containing the simplest furnishings. The

closet contains only heavy earthenware dishes.

Adjoining this room is a kitchen, and here the royal tillers of the soil often do their own cooking. They have no servants, and divide the labors of the farm with six companions, seriously doing their share.

I have heard fragments of an old song popular in the time of our civil war, in which a farmer's son relates his experiences, lamenting that he ever left the farm for military life:

"They marched me on thro' wet and dry
To tunes more loud than charming,
And I began to think that there
Was harder work than farming!"

Not so with the German princes, however, for it is said that their military training involves less arduous labor than does their agricultural.

The Honeymoon.

SHE.

"I don't think anybody dreams
That I'm a bride.
You mustn't try to hold my hand;
Be dignified!
And try to look at ease and calm—
The way I do—
As if our going off alone
Were nothing new.
And when I ask you things, just growl:
'Oh, I don't know!'
Why does that horrid man back there
Grin at me so?
Could he have guessed? Or does he just
Think I look nice?"

HE.

"Of course he does; but, dear, your hat
Is white with rice!"
—From the New York News.

A Frenchman Learns to Talk English.

"I begin to understand your language better," said Monsieur Dubois to his English friend, "but your verbs trouble me still; you mix them up so with prepositions. I saw your friend, Mrs. Murketon, just now," he continued. "She says she intends to break down her school earlier than usual. Am I right there?" "Break up her school, she must have said." "Oh, yes, I remember; break up her school." "Why does she do that?" I asked. "Because her health is broken into?" "Broken down." "Broken down? Oh, yes. And, indeed, since fever has broken up in town——" "Broken out." "She thinks she will leave it for a few weeks." "Will she leave her house empty?" "No, she is afraid it will be broken—broken—how do I say that?" "Broken into." "Certainly; that is what I meant to say." "Is her son to be married soon?" "No, that engagement is broken—broken——" "Broken off." "Yes, broken off." "Ah, I had heard that." "She is very sorry about it. Her son only broke the news down to her last week. Am I right? I am anxious to speak English well." "He merely broke the news; no preposition this time." "It is hard to understand. That young man, her son, is a fine fellow; a breaker, I think." "A broker, and a fine fellow. Good day!" So much for the word "break."—Cotton Factory Times.

The Mean Man.

Mrs. Scrappington—If somebody should threaten to abduct me and hold me for a ransom, what would you do?

Mr. Scrappington—Laugh like thunder. —Smart Set.

The Typo's Work.

The poet wrote an ode on spring
When all such things were ripe;
A country paper took the thing
And set it up in type.
But then a bungling typo came
And dropped and pied the lead;
He tried to set it straight again,
But this was how it read:

'Tis spring! Ships sail the wave-capped land,
The plough-share cleaves the seas;
The birds await the milkmaid's hand,
The cows sing in the trees;
And down the lane my sweetheart trips—
And O! she is so sweet!—
Sweet blossoms grow about her lips,
And smiles lurk in her feet.
—Catholic Standard.

A Testimonial.

"Dear Doctor: Your hair restorer is a world beater. After trying a bottle I placed it in the cupboard, and in the morning we were astounded to find a nice long hair in the butter. We have no children, and, as I am bald, and my wife is confident that the hair is no relative of hers, the fact is evident that the restorer did the work. Inclosed please find my photo."—Indianapolis Sun.

To Posterity.

The evil that men do
Lives after them—example number one;
The cornet player dies and leaves
His blasted cornet to his son.
—From the Baltimore World.

Textile Patents.

(Continued from page 1079.)

Stocking. 698,550. K. Palme, Philadelphia, Pa.

Spinning or Twisting Frame. 699,491. Leon W. Campbell, Woonsocket, R. I.

Spinning Machine. 699,672. John G. Fredericks, Reading, Pa.

Spinning Roll. 700,125. Eleazer Kempshall, Boston, Mass.

Spinning. 700,272. Jacob Widmer, New Hartford, Conn.

Traverse-Motion for Spinning Machines. 699,409. Oscar L. Owen, Whitinsville, Mass., assignor to The Whitin Machine, incorporated, Whitinsville, Mass.

Woven Elastic Fabric and Method of Making Same. 698,777. Alfred M. Ziegler, Boston, Mass.

Woven Figured Fabric. 698,743. William Scholes, Philadelphia, Pa., assignor of one-half to Joseph S. MacElroy, Philadelphia, Pa.

Warping Machine. 699,615. Jeremiah W. Dimick, Jr., and Joseph Jagger, Rifton, N. Y.

Warping Machine Creel. 699,159. Thomas C. Entwistle, Lowell, Mass.

The Drag on Your Engine

You know the tightening strain on a belt is a dead drag which must be carried by belt and engine in addition to working load.

Just add up the total of this on your larger belts alone. It's tremendous.

It's what the engine must overcome and drive before a machine moves to produce.

What a waste in power, fuel, oil and wear and tear when CLING-SURFACE will stop it.

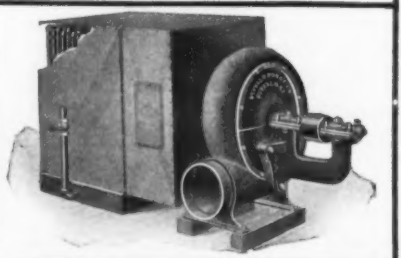
CLING-SURFACE will do this. There is no doubt about it. It will stop belt slipping everywhere and let them be run easy, preserve the belts and increase output.

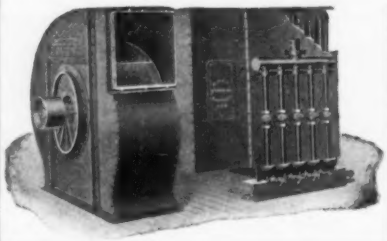
Then this saving of power can be used to make more goods. It's being done elsewhere. Ask us, or order on trial and test, paying if O. K.

CLING-SURFACE MFG. CO.,
199-205 Virginia St., Buffalo, N. Y.
BOSTON: 170 Summer St. NEW YORK: 39-41 Cortlandt St.
PHILADELPHIA: The Bourse.

Buffalo Fan System

HEATING—VENTILATING
DRYING
FOR TEXTILE MILLS
AIR CIRCULATION
UNIFORM — POSITIVE and
UNDER COMPLETE
CONTROL.





Buffalo Mechanical Draft Fans

Forced and Induced Draft.
Double your steaming capacity,
Raise your boiler efficiency,
CUT DOWN YOUR COAL BILL.

BUFFALO FORGE CO.,
BUFFALO, N. Y.

BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Air Moistening System.
American Moistening Co., 150 Devonshire St., Boston.

Architects and Mill Engineers.
Ferguson, John W., Paterson, N. J.
Gray, Arthur F., Exchange Bldg., Boston.
Green, Samuel M., Holyoke, Mass.
Suck, Adolph, 179 Summer St., Boston.

Attorney-at-Law.
Dawson, H. Horace, 309 Mutual Life Bldg., Philadelphia, Pa

Automatic Feeds for Cotton and Wool.
Atlas Foundry & Mch. Co., Newark, N. J.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila., Pa.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Smith, Jas. Woolen Machinery Co., Phila.

Baling Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

Bandings.
See under Yarns.

Bands and Labels.
Docker-Foster Co., Phila., Pa.

Baskets.
Lane, W. T. & Bro., Port Chester, N. Y.

Belting.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Boston Belting Co., Boston, Mass.
Dodge Mfg. Co., Mishawaka, Ind.
Houghton, E. F. & Co., 3rd and Somerset Sts., Phila.
Jeffrey Manufacturing Co., Columbus, Ohio.
Main Belting Co, 1219 Carpenter St, Phila.
Popham, Henry, & Son, Newark, New Jersey.
Shultz Belting Co., St. Louis, Mo.
Smith, Jas. Woolen Mach. Co., Phila, Pa.
See also Mill Supplies.

Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.
Cling Surface Mfg. Co., 168 Virginia St., Buffalo, N. Y.
Main Belting Co, 1219 Carpenter St, Phila.
Stephenson Mfg. Co., Albany, N. Y.

Belt Hooks.
Bristol Co., Waterbury, Ct.

Bindings
See Tapes and Braids.

Bleaching Materials.
Bosson & Lane, Boston.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Block Cutting for Printing.
Atlas Copper Stamp Works, 15 Whitehall St., New York.

Blowers, and Blower Systems.
American Blower Co., Detroit, Mich.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Mass. Fan Co., Waltham, Mass.
The Sterling Blower & Pipe Mfg. Co., 44 Huyshope St, Hartford, Conn.
Sturtevant, B. F. Co., Boston, Mass.

Bobbins, Spools, Shuttles, Etc.
McGuire, John A, Co, Claremont, N. H.
Murray, C. O., Nashua, N. H
Southern Bobbin Co., Greensboro, N. C.
Sweet & Doyle, Cohoes, N. Y.
Tebbets, E. L., & Co., Locke's Mill, Me.

Boilers.
See Steam Boilers.

Boxes, Cloth Boards, Etc.
Pearson, J. T, Kensington, Pa.

Boxes Paper.
See Paper Boxes.

Braiding Machinery.
New England Butt Co Providence, R. I.
Textile Machine Works, Reading, Pa.

Braids.
See Tapes, Braids and Edgings.

Brass (Perforated.)
See under Perforated Metal.

Brushes.
Felton, S. A. & Son Co., Manchester, N. H.
Parks & Woolson Mach. Co., Springfield Vt.

Brushers
See Napping Machines.

Burr Pickers.
Atlas Foundry & Mch. Co., Newark, N. J.
Curtis & Marble Machine Co., Worcester, Mass.
Sargent's, C. G Sons Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.

Calculating Apparatus
Pennsylvania-Eastern Syndicate, Bourse Building, Philadelphia, Pa.

Calico Printers' Machinery and Supplies.
Arlington Machine Works, (Arthur Birch) Arlington Heights, Mass.
Birch Brothers (Albert Birch), Somerville, Mass.
Butterworth, H. W., Sons & Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Phillips Co, The Thomas, Providence, R. I.
Taunton New Bedford Copper Co., New Bedford, Mass.
Rusden Machine Co., Warren, R. I.
See also Dyeing, Bleaching Machinery, etc

Canvas Baskets.
Lane, W. T. & Bro., Port Chester, N. Y.

Carbonizing.
Riverdale Woolen Co., Northbridge, Mass.

Carbonizing Machinery.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts, Phila.
Sargent's, C. G., Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.

Card Clothing.
Ashworth, Elijah, Fall River, Mass.
Booth, Benj. & Co., Philadelphia.
Edma Card Clothing Co, 422 S. 5th St, Camden, N. J.
Leigh, Evan A, 35 Mason Building, Boston

Card Grinding Machinery.
Hardy Machine Co., Biddeford, Me.
Smith, Jas. Woolen Machinery Co., Phila.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester Mass.

Carpet Machinery.
Altemus, W. W. & Son, 2816 N. 4th St, Phila. Pa.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A. & Son, Machine Co, Phila, Pa.
Granger Foundry & Machine Co., Providence, R. I.
Howard, Geo. C., Lansdowne, Pa. and 2123 Market St., Philadelphia, Pa.
Parks & Woolson Mach. Co., Springfield, Vt.
Smith, Jas. Woolen Machinery Co., Phila.

Castings.
American Ferrofix Co., 20 Broad St., N. Y.
Livermore, Homer F., 85 Pearl St., Boston

Chemicals and Apparatus.
Fiedt, Geo. D. & Co, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Cling Surface.
Cling Surface Mfg. Co., Buffalo, N. Y.

Clocks.
Howard, E. Clock Co., 403 Washington St., Boston, Mass., 41 Maiden Lane, New York.
Riggs & Brothers, 310 Market St. Philadelphia, Pa.

Cloth Boards.
Chaffee Bros, Oxford, Mass.

Cloth Strength Tester.
Burke & Hanford, 621 Broadway, New York.

Clutches.
American Tool & Machine Co., Boston, Mass.
Dodge Mfg. Co., Mishawaka, Ind.
Eastern Machinery Co., The, New Haven, Conn.
Hunter, James, Machine Co., North Adams, Mass.
Smith, Jas. Woolen Machinery Co., Phila.
Smith, T. H., Cotton Mill, Jamestown, N.Y.

Combs (Wool and Cotton)
Crabb, William, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St., Providence, R. I.

Commission Merchants (Dry Goods, Knit Goods).
Charleston Export & Commission Co., Charleston, S. C.

Conveying Machinery and Chains.
Jeffrey Manufacturing Co., Columbus, O.
The Sterling Blower & Pipe Mfg. Co., Hartford, Conn.

Cop Tubes.
See Paper Tubes.

Copper Gaskets.
U. S. Mineral Wool Co., 149 Liberty St., New York.

Copper (Perforated.)
See under Perforated Metal.

Copper Print Rollers.
Phillips Co, The Thomas, Providence, R. I.
Taunton-New Bedford Copper Co, New Bedford, Mass.

Copper Work for Dyers.
Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Phillips Co, The Thomas, Providence, R. I.

Cotton.
Blaisdell Jr, Co., S., Chicopee, Mass.
Charles, W. B., Amsterdam, N. Y.

Cotton Bale Ties.
DeHaven Mfg. Co., 50 Columbia Heights, Brooklyn, N. Y.

Cotton Elevators.
Buffalo Forge Co., Buffalo, N. Y.
Sterling Blower & Pipe Mfg. Co, The, 44 Huyshope Ave, Hartford, Conn.

Cotton Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila. Pa.
Ashworth, Elijah, Fall River, Mass.
Atherton, A. T., Machine Co., Pawtucket, R. I.
Barber & Colman, 11 Pemberton Sq., Boston.
Brownell, G. L., Worcester, Mass
Butterworth, H. W. & Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Houghton, L. T. & Sons, Worcester, Mass.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Kitson Machine Co., Lowell, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lever, Oswald, Lehigh Ave. and Masher St., Philadelphia.
Lowe, Stephen C., 186 Devonshire St., Boston, Agt. John Hetherington & Sons, Ltd.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
McKerrow, H. G, Boston, Mass.
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Schofield, Geo. L., Philadelphia.
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Stafford, G. W. Mfg. Co., Readville, Mass.
Whitin Machinery Wks, Whitinsville, Mass.

Cotton Openers and Lappers.
Atherton, A. T., Machine Co., Pawtucket, R. I.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kitson Machine Co, Lowell, Mass.

Cotton Softeners.
Boseon & Lane, Boston, Mass.

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Becker, C. W Agt, Amsterdam, N. Y.
Blaisdell, Jr., Co., S., Chicopee, Mass.
Charles, W. B., Amsterdam, N. Y.

Cotton Yarns.
Mueller & Littauer, 109 Greene St., New York.

Credits.
National Mercantile Agency, New York and Boston.

Cutters for Knit Fabrics.
Goodwin, J. C., Diamond and Second Sts., Phila., Pa.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

Dating and Time Stamps.
Riggs & Brothers, 310 Market St., Philadelphia, Pa.

Dextrine.
Elwell, Henry A. & Co., Philadelphia, Pa.
Stein, Hirsh & Co, 165 Duane St., New York.

Dryers.
American Blower Co., Detroit.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers (Albert Birch) Somerville, Mass.
Boston Blower Co., Hyde Park, Mass.
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Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.
Sturtevant, B. F. Co., 34 Oliver St., Boston, Mass.

Dusters.
See Wool and Waste Dusters.

Dust Collectors.
Allington & Curtis Mfg. Co., Saginaw, Mich.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
The Sterling Blower & Pipe Mfg. Co., 44 Huyshope St, Hartford, Conn.

Dyers, Bleachers and Finishers.
American Yarn Printing Works, 134-150 North 22d St., Philadelphia.
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Cohoes Dye Works, Cohoes, N. Y.
Cranston Worsted Mills (yarns), Bristol, R. I.
Davidson & Brooke, 2560 No. 3rd St., Philadelphia.
Duncan & Baillie, Cohoes, N. Y.
Firth & Foster Co., Kensington, Pa.
Greenwood, R & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Howard & Co., Rahway, N. J.
Kagermann, Edward, 1210 Orianna St., Phila.

Lorimers, The Wm. H. & Sons Co., Phila.
Molt Bros., Millbury, Mass. (Indigo Blue.)
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Pennypack Yarn Finishing Co., Holmesburg, Pa.
Pond Lily Co., New Haven, Ct.
Providence Mills Mfg. Co., 55 Girard Ave., Philadelphia, Pa.
Rowland, Samuel, Schuylkill Haven, Pa.
U S. Finishing Co., New York.
Whittier Mills, Chattahoochee, Ga., Treasurer's Office, Springfield, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.
American Blower Co., Detroit.
Antisdel, E. M., 12 Miller St., Utica, N. Y., (Knit Dryer.)
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Biren Bros. (Albert Birch), Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W, & Sons Co Phila Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Delahunty Dyeing Machine Co., Pittston, Pa.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Howard, Geo. C., Lansdowne, Pa. and 2123 Market St, Philadelphia, Pa.
Kenyon, D. R. & Son, Raritan, N. J.
Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Philadelphia Textile Specialty Co., 500 North 12th St., Phila.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Smith, Jas. Woolen Machinery Co., Phila.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)

Dye House Cans.
Hill, James Mfg. Co., Providence, R. I.

Dye Sticks.
Bailey, Frank, Cedar Brook, New Jersey.
Ford, J. B. Co., Wyandotte, Mich.
Haedrich, E. M., Philadelphia, Pa.

Dyestuffs and Chemicals.
Atteaux, F. E. & Co., 174-176 Purchase St., Boston.
Berlin Aniline Works, 72 Front St., N. Y.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Corey, S. J, 273 Congress St, Boston
Cassella Color Co., 182 Front St., New York.
Dillon & Co, 20 Cedar St, New York.
Elwell, Henry A. & Co., Philadelphia, Pa.
Farbenfabriken of Elberfeld Co, 40 Stone St, N. Y.
Ford, J. B. Co., Wyandotte, Mich.
Fortner, L. B., 36 Strawberry St., Phila.
Geisenheimer & Co, 189 Front St, New York.
Holliday & Sons, Ltd., Read, 7 Platt St., New York.
Johnson, Chas. A, & Co, 22 Dey St, N. Y
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 122 Hudson St, N. Y.
Kuttroff, Pickhardt & Co., New York.
Linnehan, J. W. & Co., 185 High St., Boston.
Molt Bros., Millbury, Mass. (Indigo Blue.)
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oil Seeds Pressing Co., 15-25 Whitehall St., New York.
Roessler & Hasslacher Chemical Co, 100 William St., New York.
Sharpless Dye Wood Ext. Co, The Bourse, Phila, Pa.
Sykes & Street, 85 Water St, N. Y.
Thayer, Ed. M., 106 Broad St., Boston, Mass.
Vila, H. S., 115 So. 2nd St., Philadelphia, Pa.

Dynamos.
General Electric Co., 44 Broad St., New York
Sturtevant, Co., B. F. Boston.

Edgings.
See Tapes, Braids and Edgings.

Electrotyping and Printing.
Whitcomb, H. C, & Co, Boston.

Elevators.
Cohoes Foundry & Machine Co, Cohoes, N.Y.
Eastern Machinery Co, The, New Haven Conn.
Jeffrey Manufacturing Co., Columbus, O.
Howard, Geo. C., Lansdowne, Pa and 2123 Market St, Philadelphia, Pa.

Electrical Construction.
General Electric Co., 44 Broad St., New York.

Electric Fans.
American Blower Co., Detroit.
Buffalo Forge Co., Buffalo, N. Y.
General Electric Co., 44 Broad St., New York.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila., Pa
Sturtevant Co., B. F., Boston.

Electric Lighting.
General Electric Co., 44 Broad St., New York.

Electric Motors.
General Electric Co., 44 Broad St., New York.
Sturtevant Co., B. F., Boston.

Employers Time Recorders.
Riggs & Brothers, 310 Market St., Philadelphia, Pa.

Engineers, Mechanical.
Ferguson, John W, Paterson, N. J.

Exhaust Heads.
Burt Manufacturing Co, Akron, Ohio.
The Sterling Blower & Pipe Mfg, Co., 44 Hupshope St, Hartford, Conn.
Sturtevant, B. F. Co., Boston, Mass.

Fans—Exhaust and Ventilating.
See Ventilating Apparatus.

Feed Water Heaters.
Green Fuel Economizer Co., Matteawan N. Y.
Scaife, W. B. & Sons, Pittsburg, Pa.

Feed Water Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Scaife, W. B. & Sons, Pittsburg, Pa.

Feeds.
See Automatic Feeds.

Filters.
Automatic Water Purifying Co, 45 Broadway, N. Y.
Scaife, W. B. & Sons. Pittsburg, Pa.

Finishing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Fluted Rolls.
Cohoes Foundry & Machine Co., Cohoes, N Y
Thurston, A. G & Son, Box 528, Fall River, Mass.

Forges.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co, B. F., Boston.

Friction Clutches.
See Clutches.

Friction Hoisting Drums
Eastern Machinery Co., New Haven, Conn.

Fuel Economizers.
Green Fuel Economizer Co., Matteawan, N. Y.
Steam Boiler Equipment Co., 20 West Houston St., New York.

Fulling Mills for Woolen Goods.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.
Kenyon, D. R. & Son, Raritan, N. J.

Garnetts.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Smith, Jas. Woolen Machinery Co., Phila.

Gas Engines.
Jones, Lewis, 60½ and Media Sts, Phila, Pa.

Gas Exhausters.
Sturtevant Co., B. F., Boston.

Gears.
New Process Raw Hide Co., Syracuse, N. Y.

Gear Cutting Machine.
Whiton, The D. E. Co, New London, Conn.

Generating Sets.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Heating.
See Ventilating.

Heddles.
Steel Heddle Mfg. Co., 1842 Germantown Ave., Phila,
Watson, L. S, Mfg. Co, Leicester, Mass.

Hoisting Machinery.
Larrabee John E., Amsterdam, N. Y.
The Eastern Machinery Co., New Haven, Conn.

Hose.
Boston Belting Co., Boston.

Hosiery Labels.
Docker, Foster Co., Philadelphia, Pa.
Saranac Electrical Mfg. Co., St. Joseph, Mich.

Hosiery Boards.
Pearson, J. T, Kensington, Pa.

Humidifying Apparatus.
American Air Moistening Co., Boston.

Hydro Extractors.
American Tool & Machine Co , Boston.
Rusden Machine Co., Warren, R. I.

Ironing Machines for Knit Goods.
Craw, J. W. Laundry Machinery Co., So. Norwalk, Conn.

Jacquard Cards.
Rogers, H. E, South Manchester, Conn.

Key Seaters.
Leisenring Mfg. Co , Philadelphia, Pa.

Knit Goods Edgings, Trimmings, etc.
Cathcart, John & Co., 115 Franklin St., New York.
Chapin, Geo. W. Philadelphia, Pa.
Charles, W, B., Amsterdam, N. Y.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger Mfg Co, Edgings, Germantown, Phila, Pa.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, Allegheny Ave. and Emerald St., Phila.
Weimar Bros, 1817 East York St, Phila. Pa.

Knit Goods Finishing Machines, Crochet, Etc.
Arnold Sewing Machine Co., 216 High St , Newark, N J.
Craw, J. W. Laundry Machinery Co., So. Norwalk, Conn.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick Co., 606 Arch St, Phila, Pa.
Scott & Williams, 2079 E. Cumberland St, Phila Pa.
Willcox & Gibbs Sewing Mch. Co., New York.

Knitting Machine Cylinders.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.

Knitting Machinery.
Adams Top Cutting Machine Co., 11 Broadway, N. Y.
American Knitting Machine Co., 6th and Arch St. Philadelphia, Pa.
Antisdel, E. M., 12 Miller St., Utica, N Y.
Babcock Machine Works, Fort Plain, N. Y.
Branson Machine Co., 506 N. American St., Philadelphia.
Brinton, H. & Co., 213 Race St., Philadelphia Pa.
Cooper Chas, Bennington, Vt.
Crane Mfg. Co. Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Goodwin, J. C. Second and Diamond Sts., Phila., Pa. (Cutters.)
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y
Keystone Knitting Machine Mfg. Co., 40 N 7th St., Phila.
Lamb Knitting Mach. Mfg. Co., Chicopee Falls, Mass.
Leighton Machine Co, Manchester, N. H.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Mueller, Arthur, 760 Lexington Avenue., Brooklyn, N. Y.
Nye & Tredick Co., 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Pepper Mch. Works, Lakeport, N. H.
Ruth & Co., Norristown, Pa.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Snyder, Homer P. Mfg. Co. Little Falls, N. Y.
Stafford & Holt, Little Falls, N. Y.
Taylor, James, 835 Arch St., Philadelphia.
Tompkins Bros., Troy, N. Y.

Knitting Needles and Supplies.
Breedon, Wm. & Son, Amsterdam, N. Y
Brinton, H. & Co., 213 Race St., Philadelphia, Pa.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co., Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Keystone Knitting Machine Mfg. Co., 40 N 7th St., Philadelphia.
Lamb Knitting Machine Mfg. Co., Chicopee Falls, Mass.
Manufacturers' Supplies Co., 66 No. 4th St. Philadelphia.
Mayo Knitting Machine & Needle Co Franklin, N. H.
Page Needle Co , Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co. Lakeport, N. H.

Knotter for Spoolers.
Barber & Colman, 11 Pemberton Sq., Boston

Labeling Machine.
Saranac Electrical Mfg. Co., St. Joseph, Mich.

Laboratory Outfits.
Feidt, Geo. D. & Co, 528 Arch St. Phila, Pa

Leather.
Houghton, E. F. & Co., 3rd and Somerset Sts., Phila.

Leather Boards.
Rogers, H. E, South Manchester, Conn.

Looms.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts. Philadelphia.
Furbush, M. A. & Son Co, Phila. Pa.
Howard, Geo. C., Lansdowne, Pa. and 2128 Market St , Philadelphia, Pa. (For wire.)
Kilburn, Lincoln & Co. Fall River, Mass.
Leigh, Evan A., 35 Mason Bldg., Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Smith, Jas. Woolen Machinery Co., Phila.
Stafford, G. W. Co , Readville, Mass
Whitin Machine Works, Whitinsville, Mass.

Loopers.
Beattie's Machine Works, Cohoes, N. Y.

Lubricators
Dixon, Jos., Crucible Co, Jersey City, N. J.

Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass.

Lumpers.
Gerry, George, & Son, Athol, Mass.

Machinery Dealers.
Jefferson, Ed, & Bro, 28 Strawberry St., Phila, Pa.
Manhattan Machine Supply Co., 106 Grand St., New York.
Schofield, Geo. L. Phila., Pa.
Taylor, James, 835 Arch St., Philadelphia

Machinists' Tools.
Dodge Mfg. Co., Mishawaka, Ind.
Whiton, The D. E. Co, New London, Conn.

Mails.
Walder, J, Paterson, N. J.

Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Mass.
Elliott & Hall, 54½ Hermon St, Worcester Mass.
Fabric Measuring & Packaging Co., Postal Telegraph Bldg , New York.
Parks & Woolson Mach. Co., Springfield Vt.

Mechanical Draft.
American Blower Co., Detroit.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co, Buffalo., N. Y.
Sturtevant, B. F. Co., Boston, Mass.

Mechanical Engineers.
Buffalo Forge Co., Buffalo, N. Y.
Green, Samuel M., Holyoke, Mass.
Sterling Blower & Pipe Mfg. Co, The, 44 Huyshope Ave, Hartford, Conn.
Sturtevant Co., B. F., Boston.
Suck, Adolph, 179 Summer St., Boston.

Mercerizing Machinery.
Butterworth, H. W. & Sons, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
Philadelphia Textile Specialty Co., 500 North 12th St., Phila.
Rusden Machine Co., Warren, R. I.

Mill Architects.
See Architects & Mill Engineers.

Mill Baskets.
Lane, W. T. & Bro , Port Chester, N. Y.

Mill Broker.
Barrow, W. B., 130 N. 12th St., Philadelphia.
Ostrander, W. M., 1452 North American Bldg, Philadelpeia.

Mill Brushes.
See Brushes.

Mill Builders and Engineers.
Ferguson, John W. Paterson, N. J.

Mill Sewing Machines.
(See Sewing Machines and Supplies.)

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bristol, The, Co., Waterbury, Conn.
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Chase Pulley Co., Providence, R. I.
Dixon Lubricating Saddle Co., Bristol, R.I
Dodge Mfg. Co., Mishawaka, Ind.
Douglas, R. D., Fall River, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Hoag, A. W. & Co., Reading, Pa.
Houghton, E. F. & Co., 3rd and Somerset Sts , Phila.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Jeffrey Manufacturing Co., Columbus, O.
Lane, W. T. & Bro., Port Chester, N. Y.
Larrabee John E., Amsterdam, N. Y.
Main Belting Co, 1219 Carpenter St, Phila.
Oil Seeds Pressing Co., 15-25 Whitehall St., New York.
Shaw, Victor, Ring Traveller Co., Providence, R. I.
Smith, Jas. Woolen Machinery Co., Phila.
Southern Bobbin Co., Greensboro, N. C.
Steel-Heddle Mfg. Co., 1842 Germantown Ave. Phila.
Sterling Blower & Pipe Mfg. Co, The, 44 Huyshope Ave, Hartford, Conn.
Sweet & Doyle, Cohoes, N. Y
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.

Moth Destroyer.
Ginseng Chemical Co , St. Louis, Mo.

Napping Machines.
Columbia Napping Machine Co., Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Parks & Woolson Mach. Co., Springfield, Vt.

Noils (Silk.)
Ryle, Wm. & Co., 54 Howard St., N. Y.
Malcolm Mills Co., Frankford, Pa.

Office Specialties.
Niagara Clip Co., 123 Liberty St., New York.

Oil Cups.
New York Lubricating Oil Co., 35 Water St., New York.

Oil Filters.
Burt Manufacturing Co., Akron, Ohio.
Houghton, E. F. & Co., 3rd and Somerset Sts., Phila.

Oils.
Houghton, E. F. & Co., 3rd and Somerset Sts., Phila.
New York Lubricating Oil Co., 35 Water St., New York.
Oil Seeds Pressing Co., 15-25 Whitehall St. New York.

Oilless Bearings.
Arguto Oilless Bearing Co, Wayne Junction, Phila.

Overseaming Machines.
Arnold Sewing Machine Co., 216 High St., Newark, N. J.
Merrow Machine Co., Hartford, Conn.
Union Special Sewing Machine Co., 75 Kinzie St., Chicago, Ill.
Von Buchwald, W. J., 120 No. 7th St., Phila.
Wilcox & Gibbs Sewing Machine Co., New York.

Oxidizing Machinery.
Hoag, A. W. & Co., Reading, Pa.

Packing.
Boston Belting Co , Boston.
Jenkins Bros., New York.

Pantagraphs for Mill Engraving.
Johnson, C. A, & Co, 22 Dey St, New York.

Paper Boxes.
Rosenberg, Henry, 107 Greene St., New York.

Paper Tubes.
Douglas, R. D., Fall River, Mass.

Patent Solicitors.
Crosby & Gregory, 34 School St, Boston.
Siggers, E. G., Washington D. C.
Wolhaupter, D. P., Equitable Bldg., Washton, D. C.

Perforated Metals.
Beckley, A. J. & Co., 248 Pearl St., New York.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
Southern Bobbin Co., Greensboro, N. C.

Pipe Covering.
Keasbey, R. A. 83 Warren St, New York.

Pneumatic Conveying.
See Ventilating.

Portable Hoists.
Larrabee, John E., Amsterdam, N. Y.

Power Transmitting Machinery.
Arguto Oilless Bearing Co, Wayne Junction, Phila.
Chase Pulley Co., Providence, R. I.
Dodge Mfg. Co., Mishawaka, Ind.
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., Lansdowne, Pa. and 2123 Market St , Philadelphia, Pa.
Hoag, A. W. & Co., Reading, Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jeffrey Manufacturing Co., Columbus, O.
Kilburn, Lincoln & Co Fall River, Mass.
Rusden Machine Co., Warren, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila.
Saginaw Manufacturing Co., Saginaw, Mich.
Smith, Jas. Woolen Machinery Co., Phila.

Preparatory Machinery, (Cotton).
Atherton, A. T., Mach. Co., Pawtucket, R. I.
Howard & Bullough Am. Machine Co., Pawtucket, R. I.
Kitson Machine Co., Lowell, Mass.
Saco & Pettee Machine Shops, Newton Upper Falls, Mass.

Press Boards and Fenders.
Rogers, H. E, South Manchester, Conn.

Presses.
Boomer & Boschert Press Co., 338 West Water St., Syracuse, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms
Hart, Charles, Frankford, Philadelphi
Howard, Geo C., Lansdowne, Pa and 2123 Market St. Philadelphia, Pa.
Phillips Co. The Thomas, Providence, R. I.
Spencer & Rideout, Nashua, N. H.
(Power, Screw, Hydraulic, Hollow Steam Plate).

Printers (Fabrics and Yarn.)
American Yarn Printing Works, Philadelphia.

Pulleys.
See Power Transmitting Machinery.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Rusden Machine Co., Warren, R. I.

Purifying & Filtration Plants.
Scaife, W. B. & Sons, Pittsburg, Pa.
Rag Pickers.
Smith, Jas. Woolen Mach. Co., Phila, Pa.
Raw Hide Gears.
New Process Raw Hide Co,. Syracuse, N. Y
Reed and Harness Manufacturers.
American Supply Co. Providence, R. I.
Leisenring, John Mfg. Co., Phila.
Loom Picker Co., Biddeford, Me.
Waider, J, Paterson, N. J.
Reeds and Harnesses.
Leisenring, John, Mfg. Co., Philadelphia,
Remnants.
Feingold, H. & D., 91 Bedford St., Boston.
Ribbons.
Barton, F. C., 54 Franklin St., New York.
Cheney Bros, S. Manchester, Ct.
Ring Travellers.
DeHaven Mfg. Co , 50 Columbia Heights, Brooklyn, N. Y.
National Ring Traveller Co., Providence, R. I.
Shaw, Victor, Ring Traveller Co., Providence, R. I.
Rope Transmission.
American Mfg. Co., New York.
Dodge Mfg. Co., Mishawaka, Ind.
Roving Cans.
Diamond State Fibre Co., Elsmere, Del
Hill, James Mfg. Co., Providence, R. I.
N. E. Ventilating & Heating Co, 980 Manton Ave, Providence, R. I.
Laminar Fibre Co., No. Cambridge, Mass.
Walrus Fibre Mfg. Co., Medford, Mass.
Rubber Covered Rollers and Goods.
Boston Belting Co., Boston.
Saddles and Stirrups.
Dixon Lubricating Saddle Co., Bristol, R. I
Sample Cards and Mounting.
Rosenberg, Henry, 107 Greene St., N.Y.
Scales
Sweet& Doyle, Cohoes, N. Y.
Scallop Machines.
Merrow Machine Co., Hartford, Conn.
Schools.
American Correspondence School, Boston, Mass
International Correspondence Schools, Scranton, Pa.
New Bedford Textile School, New Bedford, Mass.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.
Screens (Perforated.)
See under Perforated Metal.
Selling Agents.
See Commission Merchants.
Separaters.
Draper Co., The, Hopedale, Mass.
Ring Frame Thread Protector Co., The Amsterdam, N. Y.
Sewing Machines and Supplies.
Arnold Sewing Machine Co., 216 High St,. Newark, N. J.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros. (Albert Birch), Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Dinsmore Mfg. Co., Salem, Mass.
Fales, L. F., Walpole, Mass.
Kruse & Murphy Mfg. Co., 455 West 26th St., New York.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Rusden Machine Co., Warren, R. I.
Union Button Sewing Mch. Co., 164 High St., Boston.
Union Special Sewing Machine Co., 75 Kinzie St., Chicago, Ill.
Von Buchwald, W. J., 120 No. 7th St., Phila.
Willcox & Gibbs S. M. Co., New York.
Shafting Hangers, Etc.
See Power Transmission Machinery.
Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.
Shell Rolls.
Cohoes Foundry & Mach. Co. Cohoes, N. Y
Thurston, A. G, & Son, Box 528, Fall River, Mass.
Shoddies.
See Wool Shoddies.
Shuttles.
See Bobbins, Spools, Shuttles, Etc.
Shuttle Checks.
Victor Shuttle Check Co., Auburn, N. Y.
Silk Machinery.
Butterworth, H. W. Sons Co, Philadelphia
Granger Foundry & Machine Co., Providence, R. I.
Mason Machine Works, Taunton, Mass.
Rusden Machine Co., Warren, R. I.
Silo.
Schlichter, E. F. 321 Vine St., Phila., Pa.
Singe Plates.
Butterworth, H. W. Sons Co., Philadelphia.
Taunton-New Bedford Copper Co., New Bedford, Mass.
Singeing Machines.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros. (Albert Birch). Somerville. Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms.
Granger Foundry & Machine Co., Providence, R. I.
Rusden Machine Co., Warren, R. I.
Sizing. Starch and Gums.
Arabol Mfg. Co., 155 William St., New York.
Elwell, Henry A. & Co., Philadelphia, Pa.
O. K. Soap Co., 968 Franklin St., Phila.
Stein, Hirsch & Co, 165 Duane St, New York.
Slashers.
Cohoes Foundry & Machine Co, Cohoes, N. Y
Lowell Machine Shop, Lowell, Mass.
Phillips The Thomas, Co., Providence, R.I.
Smoke Prevention.
Steam Boiler Equipment Co., 20 West Houston St , New York.
Soaps.
Elwell, Henry A. & Co., Philadelphia, Pa.
India Alkali Works, Boston, Mass.
O. K. Soap Co., 968 Franklin St., Phila.
Spindles.
Bamford & Smith, Pascoag, R. I.
Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Ward & Vandergrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.
Spindle Tubes.
Bamford & Smith, Pascoag, R. I.
Spinning Cylinders.
N. E. Ventilating & Heating Co, 980 Manton Ave, Providence, R. I.
Spinning Frames.
See Cotton Machinery.
Spinning Rings.
Draper Company, Hopedale, Mass
Whitinsville Spinning Ring Co, Whitinsville, Mass.
Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson, N. J.
Spools. *See Bobbins, Spools Shuttles, Etc.*
Spooler Knotter.
Barber & Colman, 11 Pemberton Sq., Boston.
Sprinklers
International Sprinkler Co., Philadelphia, Pa.
Stamps for Hosiery.
Atlas Copper Stamp Works, 15 Whitehall St., N. Y.
Wells, Wilfred, 505 W. Lehigh Ave., Phila.
Steam Boilers.
Babcock & Wilcox Co., The, 29 Cortland St., New York City.
Brown, C. H, & Co, Fitchburg, Mass.
Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.
Steam Engines.
American Blower Co., Detroit, Mich.
Brown, C. H, & Co, Fitchburg, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Hooven (The), Owens & Rentschler Co Hamilton, O.
Rusden Machine Co., Warren, R. I.
Sturtevant, B. F. & Co., Boston.
Steam Surface Coverings.
Keasbey, Robert A., New York.

Steam Specialties.
Butterworth, H. W. Sons Co., Philadelphia
Houghton, E. F. & Co., 3rd and Somerset Sts., Phila.
Jenkins Bros., New York.
New York Lubricating Oil Co., 35 Water St., New York.
Rusden Machine Co., Warren, R. I.
Steam Boiler Equipment Co., 20 West Houston St., New York.
Sterling Blower & Pipe Mfg. Co, The, 44 Huyshope Ave, Hartford, Conn.
Sturtevant Co., B. F., Boston.

Steam Valves.
Jenkins Bros., New York.

Stop Motion for Looms.
See, Warp Stop Motions.

Tanks, Tubs and Vats.
Davis, G. M. & Son, Palatka, Fla.
Cypress Lumber Co, Apalachicola, Fla.
Hoag, A. W. & Co., Reading, Pa.
Lewis, H. F. & Co., New Orleans, La.
Rusden Machine Co. Warren, R. I.
Schlichter, E. F., 321 Vine St., Philadelphia.
Stearns, A. T, Lumber Co, Neponset, Mass.
Stevens, D. B. & Co., Auburn, Me.
Woolford, George, 2340 No. 9th St, Phila, Pa.

Tapes, Braids and Edgings.
Balton, F. C., 54 Franklin St., New York.
Cathcart, John, & Co, 115 Franklin St, N. Y
Chapin, Geo. W. Philadelphia Pa.
Friedberger Mfg. Co, Germantown, Pa.
Hamilton, J. H. & Co., 84 Franklin St., N. Y.
Krout & Fite Mfg. Co., Allegheny Ave. and Emerald St., Philadelphia.
Rueinstrom, R. A., 176 West York St., Philadelphia, Pa.
Weimar Bros, 1817 East York St, Phila, Pa.

Temples.
Draper Co., Hopedale, Mass.

Tension Pulleys.
Arguto Oilless Bearing Co, Wayne Junction, Phila.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc.

Tenter Clips.
See Dyeing, Drying, Bleaching and Finishing Machinery.

Testing Machines.
Burke & Hanford, 621 Broadway, New York.
Howard, Geo. C., Lansdowne, Pa. and 2123 Market St., Philadelphia, Pa.

Textile Schools.
See Schools.

Thread Board for Spinning & Twisting Frames.
Houghton, L. T. Worcester, Mass.

Thread Protectors.
Ring Frame Thread Protector Co., The, Amsterdam, N. Y.

Tickets and Labels.
Saranac Electrical Mfg Co. St. Joseph, Mich.

Tower Clocks.
Howard E. Clock Co., 403 Washington St., Boston; 41 Maiden Lane, New York.

Turbine Governors.
Replogle Governor Works, Akron, O.

Turbines.
(See Water Wheels.)

Twine Machinery.
Brownell, G. L, Worcester, Mass.

Twisting Machinery.
Brownell, G. L., Worcester, Mass.

Valves—Rubber.
Boston Belting Co., Boston, Mass.

Ventilating Apparatus.
Allington & Curtis Mfg. Co., Saginaw, Mich., 81 Wareham St., Boston.
American Air Moistening Co., Boston
American Blower Co., Detroit, Mich.
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Manhattan Machine Supply Co., 106 Grand St., New York.
Massachusetts Fan Co., Waltham, Mass.
New England Ventilating & Heating Co, Providence, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
The Sterling Blower & Pipe Mfg. Co., 44 Huyshope St, Hartford, Conn.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Warp Stop Motions.
Draper Co., Hopedale, Mass.

Washers (Cloth).
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers (Albert Birch), Somerville Mass
Butterworth, H. W. & Sons Co., Philadel.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mas s
Kenyon, D. R., & Son, Raritan, N. J.
Phillips Co, The Thomas, Providence, R. I.
Rusden Machine Co, Warren, R. I.

Washing Soda.
Ford, J. B. Co., Wyandotte, Mich.

Watchman's Clocks.
Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Howard, E Clock Co., 403 Washington St., Boston, Mass., 41 Maiden Lane, New York.
Nanz & Co, 127 Duane St., New York.
Pettes & Randall, 150 Nassau St., New York.
Riggs & Brothers, 310 Market St., Philadelphia, Pa.

Water Purifiers & Filters.
Automatic Water Purifying Co., 45 Broadway, N. Y.
Scaife, W. B. & Sons, Pittsburg, Pa.

Water Wheels.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Leffel, James & Co, Springfield, Ohio.
Replogle Governor Works, Akron, O.

Winders. (Back.)
Taylor, Jas., 835 Arch St., Philadelphia.

Winder Bobbins.
Sweet & Doyle, Cohoes, N. Y.

Winders. (Hosiery.)
Altemus, W. W. & Son, Philadelphia.
Foster Machine Co., Westfield, Mass.
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia.
Snyder, Homer P. Mfg. Co., Little Falls, N. Y
Universal Winding Co, 95 South Street, Boston.

Wood Pulleys.
Chase Pulley Co., Providence, R. I.
Dodge Mfg Co., Mishawaka, Ind.
Hoag, A. W. & Co., Reading, Pa.
Saginaw Manufacturing Co. Saginaw, Mich.

Wool Cleaning Compound.
Ford, J. B. Co., Wyandotte, Mich.
India Alkali Works, Boston.

Wool Combing Machinery.
Leigh, Evan A. 35 Mason Bldg., Boston.

Wool and Waste Dusters.
Atlas Foundry and Mch. Co., Newark, N. J.
Gerry, Geo. & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.

Woolen and Worsted Machinery.
Altemus, W. W, & Co, 2816 N. 4th St, Phila, Pa.
American Tool and Machine Co., Boston.
Arguto Oilless Bearing Co, Wayne Junction, Phila.
Arlington Mch. Works (Arthur Birch), Arlington Heights, Mass.
Atlas Foundry and Mch Wks Newark, N.J.
Birch Brothers (Albert Birch), Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass
Fales, L. F, Walpole, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa
Howard, Geo. C., Lansdowne, Pa. and 2123 Market St., Philadelphia, Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.

Jefferson, Ed. & Bro, 28 Strawberry St, Phila, Pa.
Kensington Machine Works, Mascher St., below Lehigh Ave., Phila.
Kenyon D. R. & Son, Raritan, N. J.
Leigh, Evan A. 35 Mason Bldg, Boston.
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia, Pa.
Lowe, Stephen C., 186 Devonshire St., Boston. Agt. John Hetherington & Sons, Ltd.
Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co. The Thomas, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Schofield, Geo. L., Philadelphia.
Smith, Jas. Woolen Machinery Co., Phila.

Wool Shoddies.

Becker, C. W., Agt., Amsterdam, N. Y.
Riverdale Woolen Co , Northbridge, Mass.
Slack, Wm. H. H., & Bro, Springfield, Vt.

YARNS, THREADS, ETC.

Wool Washing, Preparing and Drying Machinery.

Hunter, Jas. Machine Co., No. Adams, Mass.
Phillips Co, The Thomas, Providence, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Sargent's, C. G, Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.

Banding.

Moore, C. & Co, 12 S. 5th St, Phila, Pa.
Tucker & Cook Mfg. Co, Conway, Mass.
Toohey, M J. & Co., Fall River, Mass.
Whittier Mills, Chattahoochee, Ga , Treasurer's Office, Springfield, Mass.

Cotton Yarns.

American Cotton Yarn Exchange, 67 Chauncy St., Boston.
Ballou Yarn Co., Providence, R. I.
Barnesville, Mfg. Co., Barnesville Ga.
Blythe, Richard A., 114 Chestnut St., Phila.
Buckingham & Paulson, 83 Leonard St. New York.
Catlin & Co, New York and Boston.
Charles, W. B., Amsterdam, N. Y.
Dana Warp Mills, Westbrook. Me.
Dexter Yarn Co., Pawtucket, R. I.
Dodds, J. S., 517 Wool Exchange, New York.
Eddy & Street, Providence, R. I.
Spring St., N. Y.
Eichmann & Sternberg, New York.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Moeller & Littauer, 109 Greene St , New York.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
Morgan, E. A., 54 Franklin St., N. Y.
Orswell Mills, Fitchburg, Mass
Salkeld, A. D. & Bro., 66 Leonard St., N. Y.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Mills, Chattanoochee, Ga., Treas-Office, Springfield, Mass.

Cotton Yarns Wool Spun.

Broadbent, J. & Sons, Unionville, Conn.

Flax, Hemp, Jute and Ramie.

Fawcett, Hughes, 115 Franklin St., N. Y
Eichmann & Sternberg, 530 Broadway, N. Y.
Morgan, E. A., 54 Franklin St., N. Y.

Gassed Yarns.

Ballou Yarn Co., rovidence, R. I.
Dodds, J. S., 517 Wool Exchange, New York.
Eichmann & Sternberg, New York.
Greene & Daniels Mfg. Co, Pawtucket, R. I.

Glazed Yarns.

Ballou Yarn Co., Providence R. I.
Blythe, Richard A., 114 Chestnut St., Phila.
Eichmann & Sternberg, 530 Broadway, N. Y.
Indian Orchard Co., Indian Orchard, Mass.
Lorimers, Wm. H. & Sons Co., Philadelphia.
Malcolm Mills Co, Frankford, Pa.
Orswell Mills, Fitchburg, Mass.
Rockwell, E. M, Leominster, Mass.
Salkeld, A. D. & Bro., 66 Leonard St., N. Y
Skerry, A T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co. N. Y.
Whittier Mills, Chattahoochee, Ga., Treasurer's Office, Springfield, Mass.

Harness Twine.

Ballou Yarn Co., Providence, R. I.
Cranston Worsted Mills, Bristol, R. I.
Eichmann & Sternberg, 530 Broadway, N. Y.
Fawcett, Hughes, 115 Franklin St., N. Y
Moore, C., & Co., (S. W. cor. 5th and Market Sts.)
Morgan, E. A., 54 Franklin St., N. Y.
Whittier Mills, Chattahoochee, Ga., Treasurer's Office, Springfield, Mass.

Hosiery and Knitting Yarns.

Blythe, Richard A., 114 Chestnut St., Phila
Boyer, B. F. Co., Camden, N. J.
Broadbent, J. & Sons, Unionville, Conn
Cranston Worsted Mills, Bristol, R. I.
Dexter Yarn Co., Pawtucket, R. I.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Herbst, Albert & Co., E. Allegheny Ave. Philadelphia.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E., Manufacturing Co, Pawtucket. R. I.
Mitchell, James E, & Co, Phila. and Boston
Monument Mills, Housatonic Mass.
Moeller & Littauer, 109 Greene St., New York.
Queensbury Mills, Worcester, Mass.
Skerry, A. T, & Co., 47 Leonard St., N. Y.

Mercerized Yarns.

Blythe, Richard A., 114 Chestnut St., Phila.
Dodds, J. S., 517 Wool Exchange, New York.
Eichmann & Sternberg, 530 Broadway, N. Y.
Harper, E. J., 395 Broadway, New York.
Indian Orchard Co., Indian Orchard, Mass.
Lorimer, Wm. H. & Sons Co , Philadelphia.
Montgomery, J. R. & Co., Windsor Locks. Conn.
Morgan, E. A., 54 Franklin St., N. Y.
Pennypack Yarn Finisning Co., Holmesburg, Pa.

Mohair Yarns.

Cranston Worsted Mills. Bristol, R. I.
Montgomery & Co, J. R, Windsor Locks. Ct.
Morgan, E. A., 54 Franklin St., N. Y.
Whittier Mills, Chattahoochee, Ga., Treasurer's Office, Springfield, Mass.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Cranston Worsted Mills, Bristol, R. I
Eichmann & Sternberg, 530 Broadway, N. Y.
Indian Orchard Co., Indian Orchard, Mass.
Malcolm Mills Co, 229 Chestnut St. Phila. Pa
Moeller & Littauer, 109 Greene St., New York.
Montgomery & Co, J. R, Windsor Locks. Ct.
Skerry, A. T, & Co, 47 Leonard, St, N. Y.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, N Y.
Moeller & Littauer, 109 Greene St., New York.
Ryle Wm. & Co, 54 Howard St. N. Y.

Woolen and Merino Yarns.

Boyer, B. F. Co., Camden, N. J.
Broadbent, J. & Sons, Unionville, Conn.
Eaton Rapids Woolen Mills, Eaton Rapids, Mich.
Eddy & Street, Providence, R. I.
Harper, E. J., 395 Broadway, New York.
Hyde, E. S, 223 Chestnut St. Phila, Pa.
Jenckes, E. Mfg. Co., Pawtucket. R. I.
Moeller & Littauer, 109 Greene St., New York.
Rockwell, E. M, Leominster, Mass.

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This machinery has been in use 10 months, and is in perfect condition. Bids for all or a part, f. o. b. Barnesville, Ohio, will be considered from parties interested.

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I wish to retire from business for personal reasons, and will sell to right party, controlling interest in a most modern knitting mill in the South. For further information, address "Opportunity," care of Textile World.

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One 7 inch Ribber; twenty Excelsior Knitters; fifteen Boss Knitters; five National Automatics; one Scott Fulling Mill; two Coarse Loopers; one Winder. For particulars, address Des Moines Hosiery Mill, Des Moines, Iowa.

WANTED.

A practical and experienced Cotton Mill Superintendent, with some capital, to combine with $100,000, already invested in a new plant, erected in a Southern City of 25,000 population, and 8 different lines of railways besides river navigation to the sea.

The mill is partially equipped, and has bids on hand for all that may be necessary, but the Directory will leave the matter to the Superintendent and give latitude for any changes in equipment and installation that the Superintendent may advise. Address, Mr. L. C. Allen, Shreveport, Louisiana.

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The New Bedford Textile School will shortly engage a Principal of the New Knitting Department, a thoroughly practical man having experience in both Hosiery and Underwear Machinery. Applications should be made to **C. P. BROOKS, Managing Director.**

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COTTON SPINNER.

Well-bred German, 25 years old, apprenticed machinist and setter-up, at present employed in large cotton mill of Germany as spinning master wishes to meet with similar engagement or as assistant of the master. Apply to Schubert, Lechhauserstrasse, 24, Augsburg, Europe.

CAPITAL WANTED.

$25,000 to $30,000 wanted in established hosiery mill manufacturing high class full fashioned hosiery. Party investing may become official of company. Knowledge of business desired but not necessary. Address, Capital, care of Textile World.

NEW PLANT.

A man possessed of capital would like to get acquainted with bright young man, 25 to 40, thoroughly competent in knitting trade and able to attend to all the details o starting a completely new small plant. The plant would be started on stockings and increased gradually. State experience and details on what ground you expect success; also salary expected at the beginning and later. Address answer to New Plant, care of Textile World.

OVERSEER WANTED.

Wanted a capable young Englishman one who has been in this country a few years, has had good experience on Narrow Fabrics, etc., and accustomed to Crompton and Knowles looms. Address with full particulars to "Britisher," Textile World, Boston, Mass.

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COTTON SUPERINTENDENTS.

1337 **Assistant Supt.**, experienced in the manufacture of bookbinders' cloth, window shades, etc., is open to a position. English; 45 years of age; married. Prefers South. Best of references.

1853 **Supt. Cotton Mill,** or would take an overseer's position in a large mill North for the present. Has been assistant superintendent for past year, previous to which he was overseer of carding for nine years, and before that was overseer of carding and spinning in the South. First-class references. Can take position at once. Colored and white goods. English and American machinery.

189 **Cotton Superintendent** wants position in Northern mill. Has been in charge of Southern mills for 7 years. Previous experience in N. E. Is well known among mill men, and can furnish the best of references. Age 35; married.

1877 **Agent or Treasurer.** Good references. Recently assistant manager of a large mill. Fully competent.

2021 **Supt., Overseer of Carding,** assistant designer. Worked on sheetings and ginghams. Held position of overseer of carding and assistant to manager for past few years. Age 41; American. First class references.

2005 **Superintendent** of mill on plain cotton goods. Age 40; English; married. Some knowledge of designing. Has worked in a repair shop. Fair salary.

1532 **Supt.** of cotton mill, a thoroughly capable man, is open to a position. Well up on English and American makes of machinery. Has manufactured yarns both in American and Egyptian cottons, from 17s to 70s. About 40 years of age; Scotch. Has held a responsible position in a New England company for the past 10 years.

1806 **Wanted.** A position as supt. by an up-to-date man full of push and energy. A hustler and a good manager. Anyone needing a man to manage their mill will do well to correspond with him. Is up in woolen manufacture of flannels, blankets and jeans; in cotton of drills, sheetings, shirtings and cotton or jute bagging. Wages from $3 to $4 per day and house rent free. Has had long experience on above goods, especially in weaving.

1975 **A Linen Manufacturer,** who thoroughly understands linen and cotton fancy goods and damasks, is open to position as Supt. 40 years of age, Irish, married. Can refer to well-known mill owners. Terms reasonable.

1938 **Supt.** or Supt. and Designer. Age 33; Scotch; married. Fine and plain fancy ginghams, shirtings, fine sheer fabrics, cotton and worsted dress goods, plain and Jacquard silks and Jacquard bed quilts, also print cloths. Crompton & Knowles looms. All kinds of winding, beaming, warping and quilting machinery, also finishing. At present studying picking, carding and spinning machinery.

WOOLEN SUPERINTENDENTS.

1916 **Agent or Supt.**, who understands designing and also the work of every department, is open to a position. Has been a superintendent for the last 15 years, and is thoroughly competent to take charge of a large mill. Scotch Irish; 38 years old; married. Has turned out all classes of woolen and worsted goods in all wool and in wool substitutes. Is well up in the mixing and blending of stocks. References of the best.

1930 **Asst. Supt.**, woolen or worsted, or overseer of twisting, spooling, dressing. Age 40; American; married. Is familiar with English and American machinery. Excellent references.

1974 **Asst. Supt.** or Designer, woolen or worsted, who understands designing and also the work of every department. Has worked on fine worsteds, coverts, cheviots, kerseys, meltons and fancy cassimeres. Technical education acquired at Phila. Textile School. Six years' practical experience, three as designer. Age 24, American, good references. Will go anywhere.

1936 **Supt. or Designer,** an American, married, 38 years of age, is desirous of obtaining a position. Understands the manufacture of worsteds, cotton worsteds, cassimeres, meltons—steam face, flannels, and horse and bed blankets. Long experience and up-to date in methods. Moderate wage.

1976 **Manager and Buyer,** blankets, rugs and government cloths. Young Englishman, 30, managing a plant of 19 sets cards and 200 looms in England, desires similar position in the States. Thoroughly practical in every department. Salary according to results.

1982 **Supt.** of large experience in the manufacture of woolen and worsted fancies and suitings, is open to an engagement as supt. or designer. Age 45; American; married. Good references.

1983 **Supt. and Designer** of woolen and worsted dress goods or men's wear, is open to a position. 42 years old; American citizen of German extraction. Familiar with jacquard work as well as dobby. Good references.

1829 **Woolen Supt.**, or asst. or dyer. Age 35; American; married. Has worked on kerseys, coverts, worsteds, cassimeres and fancy cottons, etc. Is familiar with Davis & Furber jacks and mules, and Crompton & Knowles.

1890 **Manager or Supt.** of a woolen mill, who understands designing, is open to an engagement. 34 years old; Scotch, and single. Large experience in Scotch and Canadian mills on tweeds, worsteds, overcoatings, etc. Good references.

1891 **Supt. of Woolen or Worsted** Mill, who understands designing, is open to a position. 23 years of age; an American; single. Well recommended, and with good experience.

WOOLEN CARDERS.

1953 **Boss Woolen Carder,** experienced on all classes of wool, all cotton, wool and cotton, and shoddy mixes, desires a position. Is an American; married; 40 years old. Leaving present position on account of shutdown. Is steady, reliable, and can give good references from last employers. Three workers in family.

1617 **Boss Carder or Second Hand.** Has held several first class jobs also has had experience in spinning. Can accept position at once. All grades of stock, including shoodies, and cotton and wool and all wool.

2000 **Secondhand Carder** familiar with all wool, wool and cotton and shoddy mixes on Davis & Furber and Furbush cards would like to obtain a position. 21 years old, American. Good references.

1944 **Carder,** or carder and spinner. Age 48; married; American. Has worked on all kinds of woolens, and of late on shoddy and cotton mixes. Is familiar with Davis & Furber machines. Excellent reference from past employer.

1903 **Boss Carder,** woolen or worsted mill, desires a position. Experienced on fine and coarse work; 27 years of age; American; married. Can refer to responsible parties. Moderate wages desired. Will go to any part of United States.

COTTON CARDERS.

1968 **Overseer** of cotton carding and combing, who understands setting up and starting new machinery, is open to a position. 33 years old, English, married. Is especially good on fine combed Egyptian and Sea Island yarns. Best of references. Moderate wage.

1919 **Overseer Cotton Carding and** Spinning, who has had an experience of over 10 years in N. E. and New York mills, is open to a position. 26 years old; American; single. Thoroughly competent and reliable. Best of references.

1932 **Overseer of Carding** or would take assistant superintendent position. Age 27; American; single. Carded and combed American, Egyptian and Sea Island Cotton, making yarns from 8s to 100s; both plain and colored goods. Can come at once.

1718 **Overseer of Card Room** desires a position in cotton mill. About 26 years of age, steady and strictly temperate. Has been six years second hand and two years overseer. Best of references.

1991 **Secondhand Comber** or Carder who is at present handling 75 cards and eight combs, is open to a position. 30 years old, French, married. Is familiar with all well known makes of machinery. Good references. Terms reasonable.

2001 **Overseer of Carding** who has had experience in some very large cotton mills in Massachusetts wishes to obtain a position. Understands the running of both coarse and fine goods and is familiar with all makes of cards. 41 years of age; American; married. Good references. Moderate wages.

2022 **Overseer of Carding.** Age 47; American; married. Worked on both wool and cotton. Is familiar with Davis & Furber and James Smith machinery.

WOOLEN SPINNERS.

1927 **Overseer Spinning,** carding or flyers. 37 years old; married, and can furnish best of references. Twenty-three years' experience. A German.

1969 **Overseer** of woolen spinning would like a position in a good mill. Has worked on woolen, cotton mixes, and shoddies from 1 to 38s. 26 years of age, temperate and steady. Good references.

1987 **Overseer** of woolen spinning desires to make a change. Is familiar with suiting, union, cassimere, satinet and knitting yarns and all ordinary makes of machinery. 30 years of age; American; married. Good references as to character and ability.

1956 **Overseer Woolen Spinning,** 34 years old, American, married, desires position. Understands Johnson & Bassett, Davis & Furber, Cleveland Bros. and Woonsocket mules; and has made all wool, merino and shoddy mixes. Can give good references.

1941 **Boss Spinner.** Wants $3.50 or more. One daughter a spooler and twister. Excellent references. Is familiar with Davis & Furber, Johnson & Bassett, and other makes of machinery.

COTTON SPINNERS.

1960 **Overseer of Cone Winding** and spooling or ring spinning, who understands Universal, Foster, Broadbent and Payne winders, and Whitin and Mason frames, desires a position. Has worked on carded and combed yarns from 4s to 160s; also, mercerized, gassed and bleached yarns from 2 to 8 ply. Young man; American; married, and can give satisfactory references from large mills.

1950 **Overseer** or second-hand of cotton mule spinning desires a position in the Southern States at reasonable wages. Is a good fixer and has made yarns ranging from 4s to 40s. 39 years old; German; married. Best of references. One worker in family—drawer in.

2009 **Overseer Ring Spinning,** spooling and warping. Might accept a good secondhand job. Age 43; American; married. Ten years' experience as second-hand, and last six years been overseer. Worked on white work from 4s to 38s.

2020 **Overseer of Ring Spinning** or asst. supt. Age 29; English; unmarried. Is familiar with all grades of cotton. Good experience and excellent references.

2003 **Overseer of Mule Spinning** who has had a wide experience in large New England mills on yarns ranging from 24s to 160s is open to a position. 37 years old; American. Good references.

1984 **A Secondhand** of mule spinning would like a position in a cotton mill. 24 years of age; American. Is familiar with almost all kinds of stock and thoroughly understands Mason mules. Best of references. Is willing to go South.

1519 **Overseer Spinning.** Age 31; American; married. Has worked on yarns from one run to 5/4. Will accept an average salary. At present employed, but wishes to better himself.

WOOLEN WEAVERS.

1959 **Boss Weaver,** who is familiar with cotton, woolen and worsted looms, and all classes of goods, is open to a position in a large mill. 46 years of age; American; married. Strictly temperate and is recommended by some very large N. E. woolen and cotton mills.

1964 **Boss Weaver,** familiar with all makes of woolen and worsted machinery, and who has worked on ladies' dress goods and men's wear, desires a position. 39 years of age; American; married. Can give good references.

1949 **Boss Weaver,** capable of taking entire charge of a small woolen mill, will be open to a position in a few weeks. 44 years old; American; married. Familiar with all classes of woolen and worsted goods. Good references. Three workers in family.

2019 **Boss Weaver** or assistant designer. Wants position with a firm who is willing to advance a man as he proves himself worthy. 28 years old; married, and a steady worker. For past six years worked in all parts of the weave room and pattern room, pattern weaving and dressing, chain building, harness raising, perching, fixing and regular weaving. Now taking course of study in woolen and worsted designing. Excellent reference.

2008 **Overseer of woolen** or worsted weaving. Would consider second hand or good fixing job. Age 37; married; American. Wants N. E. States. Worked on all classes of woolen and worsted goods, including paper makers' felts. All kinds of harness looms.

COTTON WEAVERS.

1992 **Boss Weaver** who also understands the management of drawing-in, pattern and slasher rooms, is open to a position. Is familiar with all ordinary makes of cotton looms and has handled ginghams, Shirtings, dress goods, etc. 36 years old, American, married. Good References

1985 **Overseer** of cotton weaving, thoroughly familiar with the weaving of cotton duck, sheetings, drills, twills, stripes, osnaburgs, and all plain goods is open to a position. Understands Lowell, Crompton & Knowles, Draper, Lewiston, Whitin, Bridesburg, English and Clipper looms, and several other makes. 34 years of age, American, married. Terms reasonable. Good references.

2016 **Overseer of Weaving.** Age 35; Scotch; married. Good experience, and excellent references. Crompton, Whitin, Lowell, Colvin, Woonsocket and English looms. Sheetings, lawns, ginghams, flannels, fine worsteds, dress goods, shirtings and novelty goods.

2006 **Overseer of Weaving,** drawing and slashing. All classes of cotton goods and machinery. Age 49; married. Good experience.

1998 **Boss Weaver** at present handling about 1,000 looms on fancy and plain goods, wishes to obtain a position. Familiar with Stafford and Crompton heads, Mason Kilburn, Lincoln, and Whitin looms. 39 years old; English; married; 3 weavers in family. Good references.

KNITTERS.

1943 **Fixer or Foreman.** Age 27; American; married. Has had five years' experience on knitting machines, including Standard B and C machines, can handle new Victor machines, also sewing machines. Wants to change on account of location.

1945 **Asst. Supt.,** or overseer of a large stitching department in knit underwear mill. Willcox & Gibbs sewing machines, Union Special and loopers.

1989 **Boss Knitter,** underwear, who has had a wide experience on wool, worsted, silk, lisle and cotton mixed underwear, is open to a position. Familiar with McMichael & Wildman, Nye & Tredick, Snyder & Fisher, Stafford & Holt, ribbed machines; Tompkins, Campbie & Clute, spring needle. 34 years old, German, married. Good references.

1961 **Supt. or Manager** of large hosiery yarn mill will be open to a position shortly. American; married. Has manufactured in the South hosiery yarns in natural state, mixtures, silver grays, bleached and colored. Can refer to influential men.

1951 **Overseer** of cuff knitting, who thoroughly understands fixing Tiffany and Cooper machines, wishes position. 45 years of age; English; married. Good references.

1939 **Boss Knitter.** Age 42; English descent; married. Has one girl who is a winder. 11 years as foreman knitter in one mill, and for the past seven years in full charge of knitting and winding in a mill, but wants to change on account of locality. Campbell & Clute, Tompkins and Crane machines. Balbriggan underwear, fleece lined and two-thread work, also fancies. Worked mostly on woolen goods.

1906 **Supt. or Agent** of a hosiery mill is open to a position. Thoroughly understands spinning, dyeing and is familiar with all well-known makes of knitting machinery. American; 24 years old; single. Has been superintendent for the last seven years in a large plant. Best of references.

1993 **Boss Knitter and Fixer** on ladies' and gents' ribbed underwear on S. & W., N. & T., M. & W., B. & D., S. & H., Ruse, Champion, S. & F. machines is open to a position in any part of the United States. 30 years old; American; married. Good references. Wants $4.

1657 **Superintendent or Foreman** of seamless hosiery familiar with cotton and woolen goods on Scott & Williams, Electric, Acme, Standard and several other makes, ribbers, loopers, sewing machines, etc., is open to a position. 40 years old; American; married. Best of references.

1951 **Cuff Knitter and Fixer.** Wants a place where he will have steady work.

2007 **Supt or Mill Manager.** Age 27; single. Is practical in any department. Able to adjust loopers, ribbers, etc. From shipping clerk has had charge in turn, pressing and drying, looping, paring and packing departments. Has hired labor, made up new lines and bought some of the stock. Is familiar with office work.

2018 **Foreman** or fixer of a knitting mill making golf goods, sweaters, cardigan jackets, caps, petticoats and other kindred goods. Age 31; German; married

MISCELLANEOUS.

1994 **Wanted** a postion in either mill or selling office of a textile manufacturing business by an American of extensive practical and theoretical knowledge in all textile branches, well versed in German and French. Age 28 years. Can furnish best of references.

1988 **A Young Man,** 23 years of age; American; who has had 18 months' experience in a woolen mill and is at present a student in a textile school, is willing to begin at the bottom of the ladder with a good mill where there is prospect of advancement. Small pay to start. Good references.

1980 **An Expert** on soap making and wool scouring will be open to a position shortly. Is familiar with the treatment of all grades. About 40 years old. English; married. Has worked for one concern in the United States for 12 years.

1981 **Master Mechanic;** 46 years of age; American; married; who has been employed in large cotton mills in the country is opened to a position. Is a practical man and thoroughly understands cotton machinery. Best of refereaces from well known mill men.

1924 **Assistant Supt.,** boss spinner and boss dresser desires a position in a woolen mill. 39 years of age; an American; married. Has worked on all classes of woolen goods on both English and American machinery. Good references from former employers. 15 years' experience.

2002 **Asst. Supt.** or Master Mechanic. Position wanted by an American young man with 12 years' experience, capable of anything from a new building to complete operation of a dye, bleaching and finishing plant on cotton goods Knowledge of drawing and electricity.

1914 **A Young Man** who thoroughly understands the keeping of mill books would like a position in the Southern States or would go to Cuba or Puerto Rico Is a first-class man and perfectly familiar with general office work. An American; 22 years of age; single. Steady and reliable, and can give good references.

2017 **Loom Fixer.** Age 44; Irish; unmarried. Crompton & Knowles' Stafford and Jacquard. Can take position at once. Good references.

1482 **Weaver or Wool Sorter.** Has worked on cassimeres. cheviots, tricots, kerseys and cloakings. Good references.

2014 **Loom Fixer,** secondhand or overseer. Age 45; American; married. Crompton & Knowles, Lowell, Bridesburg and Thomas Wood machinery. 2 to 20 harness.

2024 **Master Mechanic.** Age 28; English; married. Served seven years' apprenticeship in England to millwright engineering. Is familiar with engines, dyeing and bleaching machinery, cotton machinery and paper mill machinery.

2023 **Foreman of Repair Shop.** Age 30; American; married. Several years' experience in cotton mill repair work. Is familiar with almost any kind of machinery as far as repairs go,—Lowell Machine Shop, Hetherington, Kitson, Providence, Biddeford, etc.

What Position Do You Want?

Our business is to qualify ambitious people for better positions and better pay. We have been doing this for ten years and can prove that we know how. Recently we purchased the American Correspondence School of Textiles, of New Bedford, Mass., C. P. Brooks, Director. Our unique system of training people by mail for better positions (which we help them get) is now open to any textile worker that wants to qualify for better pay. Cut out, fill in, and mail the coupon below.

International Correspondence Schools,

Box 860, Scranton, Pa.

Please send me free Circular F, explaining how I can qualify for the position marked (X) below.

	Cotton Mill Supt.		Dynamo Tender
	Boss Cotton Carder		Motorman
	Boss Cotton Spinner		Steam Engineer
	Boss Cotton Weaver		Marine Engineer
	Woolen Mill Supt.		Surveyor
	Boss Woolen Carder		Architect
	Boss Woolen Weaver		Arch. Draftsman
	Woolen Designer		Sign Painter
	Cotton Designer		Letterer
	Mechanical Engineer		Chemist
	Machine Designer		Ornamental Designer
	Mechanical Draftsman		Navigator
	Foreman Machinist		Bookkeeper
	Foreman Toolmaker		Stenographer
	Foreman Blacksmith		Teacher
	Foreman Molder		To Speak French
	Foreman Patternmaker		To Speak German
	Electrical Engineer		To Speak Spanish
	Electrician		

Name _____

Occupation _____ *Age* _____

St. & No. _____

City _____ *State* _____

DYERS.

1972 **Boss Dyer** of large experience on cotton, cotton and wool, shoddy waste, camel hair raw stocks; all wool flannels, ladies' dress goods, worsteds, friezes and Union piece dyes; and skein dyeing, hosiery, etc., is open to a position in a woolen, worsted or hosiery mill. 50 years of age, English (naturalized), married. Best of references. Terms moderate.

1995 **Boss Dyer** who has been 12 years in a large Connecticut woolen mill is open to a position with any good concern. 40 years old; American; married. Piece dyes, yarns, mohair, wool stock, indigo vats, fancy shoddies and raw cotton. 17 years' experience. Good references. Terms moderate.

1979 **A Boss Dyer,** who has been assistant dyer in one of the largest mills in the United States for the last ten years, is desirous of making a change. Is familiar with wool slubbing, worsted yarn, and pieces; cotton raw stock, skein and warp yarn, pieces, and also Union goods. Understands all modern dyeing machinery. Best of references. Salary moderate.

1966 **A Color Mixer,** chemist or cotton piece dyer is open to a position English; 30 years old; married. Was assistant manager of large print works in England for three years, and can refer to well-known men. Terms moderate.

2013 **Superintendent** of dyeing and finishing, or assistant manager of a woolen mill where dyeing and finishing is done. Can design. Age 41; English; unmarried. Worked on all classes of woolen and worsted goods, cotton linings, cotton velvets and plushes. To secure permanent position is willing to start for small salary.

DESIGNERS.

1996 **Designer or Assistant Superintendent** desires a position. 27 years old; Scotch; married. Familiar with all well known makes of machinery and with woolen, worsted and cotton goods. Good references. Will go to any part of the United States. Terms reasonable.

1997 **A Young Man,** 23 years of age, English, would like a position as assistant designer or boss weaver. Has worked on woolen dress goods, cloakings, suitings and worsted suitings. Good references. Moderate wages. Three weavers in family.

1117 **Designer. Boss Weaver** or Superintendent, familiar with fancy cassimeres, fancy worsteds, dress goods, golf goods, plaid backs, coverts, shoe cloth, unions, etc., is desirous of obtaining a position. 40 years of age; American; married. Best of references. Terms moderate.

1962 **Designer,** boss weaver, or both, desires a position in a woolen or worsted mill. Is at present employed as designer and boss weaver on worsted and woolen dress goods and suitings, and giving satisfaction. 30 years old; Swede; married. Expects moderate salary. Will go to any part of the United States. References from well known textile men.

1923 **Assistant Designer** on woolen or worsted dress goods and suitings is open to a position. Age 21; American; single. A graduate of one of the largest textile schools in the country, and has had experience in a good New England mill. Also understands flannels and satinets. Good references.

FINISHERS.

2004 **A Boss Finisher** of over 25 years' experience on fancy cassimeres, worsteds, dress goods, serges and a large variety of steam finished goods, beavers, kerseys, cloakings, meltons, cheviots, etc., is open to a position. 44 years old; American; married. Good references. Moderate terms.

1526 **Foreman of Finishing Room,** Folding, Packing, etc. Age 45; married; English. Has worked on white and colored goods and prints. Is acquainted with every kind of machinery used in his business. Has worked 20 years in this country. Can give good references.

1990 **A Foreman** in Finishing room on all kinds of cotton piece goods. Accustomed to all kinds of folding, packing, etc., and machinery used therein. English, married, age 36. Five years in last situation. Has been in this country 12 years. Can give references from present and past employers.

1921 **Boss Finisher** of a satinet mill or secondhand of a woolen mill, would like a position. Has held these positions in good sized mills, and is familiar with satinets and woolens. 23 years of age; American; single. Good references as to steadiness, reliability and quality of work.

1970 **A good Second-hand Finisher** who thoroughly understands Union cassimeres, meltons and satinets, would like a position. 40 years of age, American, married. Well up on all well-known makes of machinery, and capable of taking a boss job. Good references. Reasonable wages expected.

1526 **Foreman of Finishing Room,** Folding, Packing, etc. Age 45; married; English. Has worked on white and colored goods and prints. Is acquainted with every kind of machinery used in his business. Has worked 11 years in this country. Can give good references.

1900 **Boss Finisher** of men's wear, ladies' dress goods, worsteds, cassimeres, kerseys, cotton and woolen mixes, who has gained his experience as finisher in some of the large English and American mills, is open to a position. Is familiar with all standard makes of finishing machinery; 48 years of age; Scotch; married. Can refer to well-known men.

1911 **A Boss Finisher** of over 20 years experience on cassimeres, flannels, dress goods cloakings and worsteds, is open to a position. Understands Parks & Woolson, Curtis & Marble, Hunter, Miller Press Co., Rodney Hunt and other machines. Married; 44 years old, and can give good references. Over 15 years in last place.

1958 **Boss Finisher** of underwear, cotton or wool mixed goods, who understands Wheeler & Wilson buttonhole machines, Union Button, Union Special, etc., is open to a position in the New England or Middle States. 30 years; American; married. Been employed for a number of years by concern for whom he is now working. Exceptionally good references.

1808 **Boss Finisher.** Has worked on worsteds, cassimeres, blankets, overcoatings, cloakings, flannels, dress goods, satinets unions and beavers, and is familiar with most all makes of machinery. Age 39; American; married. Has had a large experience, and can furnish most excellent references from past employers.

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I buy and sell high-grade, established enterprises, such as mills of all kinds, gas and electric plants, street railways, waterworks, and good businesses of every sort, NO MATTER WHERE LOCATED. If you want to sell, secure a partner, or procure special capital, write me (confidentially, of course) at once and I will outline (free of charge) a definite, practical, detailed plan for obtaining the desired result. The plan will be of great value to you whether you need any further help from me or not. It is yours for the asking, and when you get it you will be glad you asked. Direct your letter to my Home Office, Philadelphia, and it will have my prompt and personal attention. My branch offices are maintained exclusively for closing deals after the business has been placed in my hands. Write to-day.

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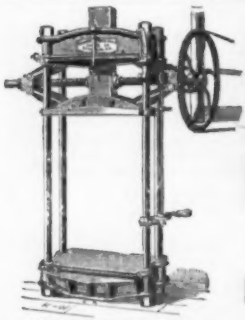

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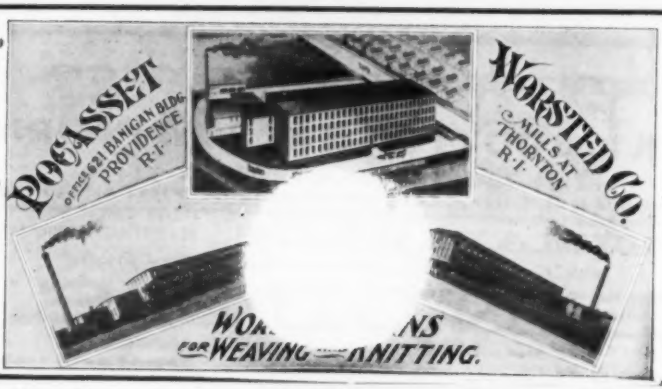

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Cones, Cops, Warps, Skeins,
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Peeler, Egyptian, Mixed Colors.
Large Assortment.

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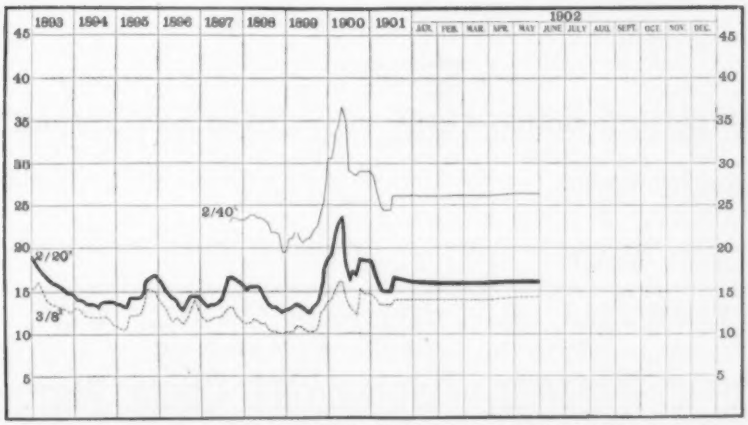

GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Cotton Yarn Market.

The continued high price of raw cotton has served to strengthen the yarn market, and while buyers have hesitated about closing contracts, preferring to purchase only for immediate wants, the sales that have been made during the past four or five weeks have kept well up to quotations, and buyers have been unable to secure the concessions they desired and have secured in the not distant past.

Fine yarn has been particularly strong, owing both to the advance in Egyptian cotton and the popularity of mercerized effects in both woven and knit fabrics.

While the market has been fairly strong, there have been many complaints on the part of spinners, that with the prices for raw cotton and yarn where they are today, the spinner cannot make a profit.

The carpet and upholstery yarns have been quiet, owing to the threat of a strike on the part of the help, weavers being naturally unwilling to make contracts for a period when their mills might be closed by the refusal of their operatives to work.

There has been but little change in the market for hosiery and knitting yarn. The spinners of fine yarn are busy, while the weakest spots in the market are found, as has been the case for two years, in the coarse grades.

There has been a quiet market for Southern yarn. The combination of Southern spinners has not yet been effected. It is a matter for congratulation, however, that the Southern spinners are endeavoring to limit their production of yarn to keep it within the demand of the trade. A continuance of this policy will not only improve present conditions, but also prevent a repetition of the disastrous experience of the past two years.

We quote as follows:—

Cops.

6s	14¾
8s	15¼
10s	15¾
14s	16¾
16s	17¼
22s	18¾
24s	19½
26s	20¼
30s	21½
34s	22-22½
36s	22½-23½
40s	24½-25

On cones, ¾c. more up to 14s; 1c. more from 15s to 22s; 1½c. from 23s to 35s, and 2c. above that.

Eastern Two-Ply Skeins, Carder Peeler.

12s	17-17½
14s	17¾
18s	18¾
20s	19¼
22s	19¾
26s	21
28s	21½
30s	22
36s	24½
40s	26½
45s	28½
50s	32½
55s	35½
60s	41

Eastern Two-Ply Warps, Carder Peeler.

2/30s	22½
2/36s	24½
2/40s	26½-27
2/45s	29-29½
2/50s	33¼-34
2/60s	42-43

Egyptian Weaving Yarns.
Single Skeins Combed.

30s	31½-32½
35s	33½-36½

The J. R. MONTGOMERY CO.,

WINDSOR LOCKS, CONN.

Manufacturers of

Mercerized Cotton Yarns. GIVES THE HIGH SILK-LIKE LUSTRE IN KNIT GOODS AND WOVEN FABRICS

Novelty Yarns. BOUCLE, BOURETTE AND SPIRALS, IN COTTON, WOOL WORSTED, MOHAIR AND SILK,

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Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade. **PAWTUCKET, R.I.**

MONUMENT MILLS,

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White, Colored, Fancy and Double Twist

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GASSED YARN, Harness and Seine Twines and other Job Gassing, Winding, &c. All Numbers. **SPECIALTIES**

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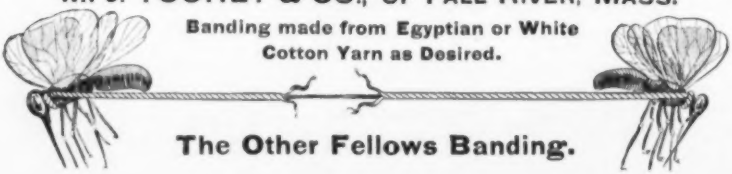

The Other Fellows Banding.

40s	35-35½
45s	36-37
50s	39-40
55s	41½-42½
60s	49-50
70s	56½-57
80s	67-68
90s	71-72

Two and Three Ply Skeins, Combed.

30s	33-34
36s	35-36
40s	36½-37
45s	37-38
50s	42-43
55s	46-47
60s	48-49
65s	53-54

Philadelphia Yarn Market.

The market has stiffened up considerably on some numbers of yarn, but there are a few people who are offering yarn at lower figures than are readily obtained by others; it is often done by cutting the stock where there are occasional lots of yarn which are of uncertain value, to be worked off.

With cotton more than 2 cents higher than in November, our spinners claim it is impossible to make the yarn except at a considerable advance, as values then were abnormally low.

Egyptian yarns have advanced quite sharply with the staple, and the demand keeps remarkably good for them, largely on account of the increased use of mercerized yarn.

Values today are about as follows:—

7s and coarser	14½
8s and 9s	14¾

Southern frame cones (good quality):—

10s	15
12s	15½
14s	15¾
16s	16¼
18s	16½-16¾
20s	17
22s	17½
24s	17¾-18
26s	18½
30s	20
40s	25½-26
50s	32-33

Southern high grade mule yarn:—
Cones.

10s	16 to 16½
12s	16½ to 17
14s	17 to 17½
16s	17½ to 18
18s	18 to 18½
20s and 22s	18½ to 19
24s	18½ to 19

RICHARD A. BLYTHE,
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Cotton Yarns of every description.
114 Chestnut Street, - PHILADELPHIA.

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122-124 Chestnut St., PHILADELPHIA, PA. Brown Building 185 Summer St., BOSTON, MASS.

LINEN YARN IMPORTER.
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

J. S. DODDS,
517 Wool Exchange, New York, N. Y

MERCERIZED YARNS
Two and Three Ply, for All Purposes,
In Peeler, Egyptian and Sea Island, gassed and ungassed, natural and dyed. Fast Black for cross dyeing a specialty.
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A. D. SALKELD & BRO.
With
FRED'K VIETOR & ACHELIS.
YARNS,
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IMPORTERS AND MANUFACTURERS OF
Silk, Worsted, Woolen, Cotton & Mohair Yarns and Tinsel. Chardonnet Artificial Silk.
Mercerized, Turkey-Red, Swiss Emb. Yarns.
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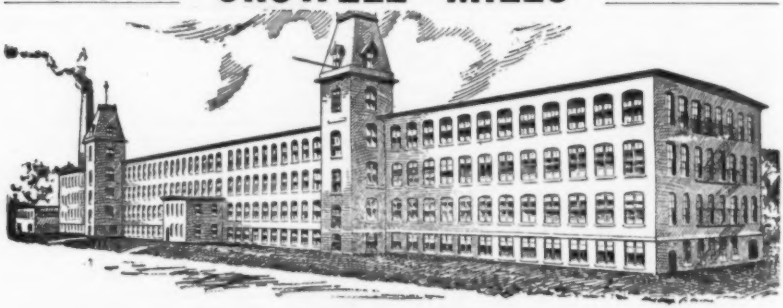

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WHITE AND COLORED WARPS,

6s to 50s—Single and Ply.

MULE COPS,

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AMERICAN AND ECYPTIAN COTTON.

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Cotton Warps and Yarns. In Grey and all Colors. Single or two or more Ply, and Cable Cord

Novelty Yarns. in Various Patterns. Colors and Twists.

Carded and Colored Cotton. For Mixing with wool. Machined or in Roving.

Indian Orchard, Mass.

E. Morgan, Press. H. B. Wight, Treas. W. C. Godfrey, Agt.

Southern frame yarn, lower grades:—

6s and 8s	14-14½
10s	14¾

Eastern cones (high grade quality):—

10s	16½-16¾
12s	17-17¼
14s	17½-17¾
16s	18-18¼
18s	18½-19
20s and 22s	19-19½

Lower grades, Eastern yarn:—

6s and 8s	14-14½
10s	14¾-15

Rise ¼c. per number to 16s.

Besides this, there is some comber waste used, that is made into 8s and 10s cones and sold at 14½-15.

Skein yarn (mostly Southern):—

4s to 6s soft	14-14½
10s to 12s	14½-15
14s to 20s	15-16
22s	16-16½
14/2	15½-16
16/2	16-16½
20/2	16½-16¾
30/2	18½-19
40/2	23-24
16/3 slack	16-16½
12/3 slack	15½-16
8/3 carpet	14½-15

Skein yarn (mostly Southern):—

8/3 slack	14½
9/4 slack	14½

Warps (mostly Southern):—

14s to 16s	15½-16
20s and 22s	16-16½
26s	16½-16¾
14/2	16
16/2	16-16¼
20/2	16½-16¾
24/2	17-17½
30/2	18½-19
40/2	23-24
40/1	24-25

Mixed colored yarns (mock twist, half colors):—

6s to 40s	16-16½
12s to 14s	16½-17½
16s to 18s	18-19

Silver and jaeger, 1½ to 2c. over white.

Mock Egyptian, 3c. advance over white.

Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

Spinners are getting rather short of both orders and material and within the next three or four weeks will be anxious to secure orders from the fear of running short time.

Prices are now within the range of manufacturers with an upward tendency. Spinners are urging customers to place orders early, as they are able to buy old wool to better adantage than will be the case when the new wool arrives; with the old wools cleared up, spinners must advance prices 3 to 5 cents per pound.

The weavers continue busy but the rush is over until the new light weight season opens. The past season has been one which has taught caution to buyers, and many weavers escaped disaster by

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
316 Church St., New York.
206 Chestnut St., Philadelphia.

Walcott & Campbell Spinning Co.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., - N. Y.

E. JENCKES MFG. CO.
Colored Cotton Hosiery Yarns, Double and Twist Yarns for the Weaving Trade.
PAWTUCKET, - R. I.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON **WARPS**
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40s and above. AND
FITCHBURG, MASS. **WARPS**

COTTON, WORSTED, WOOLEN, MERINO AND FRENCH SPUN YARNS
Mercerized Cotton a Specialty
Write for Samples.
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54-56 Franklin St., N. Y. City.

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Worsted and Mohair Yarns—white or colors, in skeins, on spools, cones, or shuttle bobbins.

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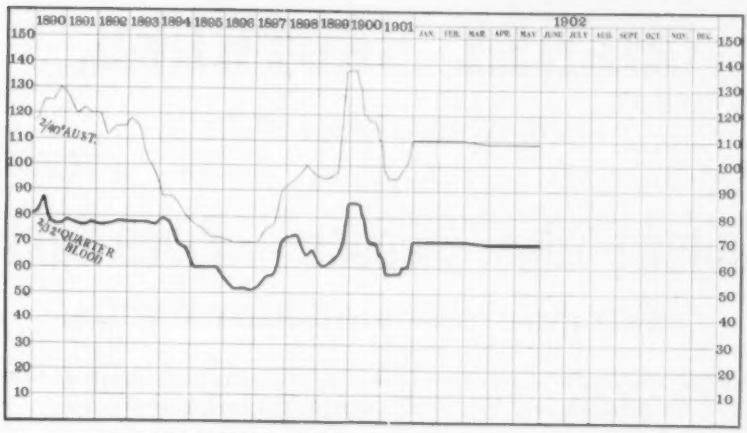

CHART SHOWING RANGES OF PRICE OF WORSTED YARN.

a narrow margin. It has been a season where the business has been good in spots; that is, some mills have been getting all the business, and in consequence running much overtime, some having employed three shifts of help, running day and night.

It may be, however, that many additional orders will be placed, as the seasons are running later or nearer the consumer each year. With the great curtailment of production it does not seem as though cloth enough had been purchased to cover requirements; buyers have been very cautious about placing orders, and, when goods have not been delivered on time, these orders have been canceled.

It must also be remembered, taking last year as a criterion, that a poor business was secured up to June, when in July the real business of the year started, which ran the mills steadily until December.

What we wish to impress is that, although certain mills have been busy on

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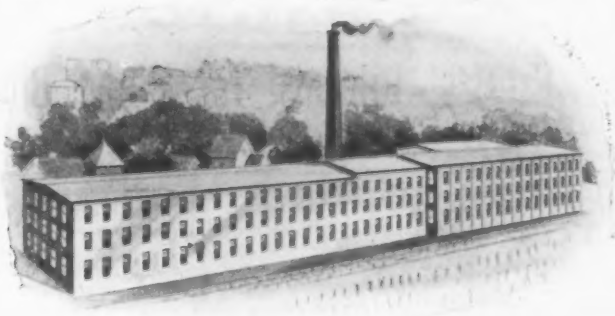

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UNIVERSAL WIND { For braider cops—warp yarns—grey or colored—2 inch to 12 inch traverse.

Dyeing facilities are new and best quality work guaranteed.
We are prepared to dye yarns for other parties.

WHITTIER MILLS, Selling Office, Springfield, Mass.
Mill, Chattahoochee, Ga.

account of the strike, had all the mills been running up to now, only an average season's business would have been secured, and that we have the substantial business of the year ahead of us to begin in July.

The situation is certainly a healthy one, both for the weavers and the spinners.

Weavers are reducing contracts, and, if further orders are secured, will be on the market for considerable material. Weavers, however, are buying but little yarn at the present time; they state it is too early, as the light weight season has not yet opened and they do not know just what their requirements are to be. The weavers have become cautious because of their narrow escape from disaster in purchasing yarn on speculation last November; nevertheless, it is predicted that those who buy early will buy cheapest. To prove this, last year's conditions again are cited; in April and May, worsted prices were at their lowest; in July, business began and prices on yarn advanced to such an extent that weavers who gave orders for low cost yarn, got the goods only with great difficulty.

We look for a revival of the clay worsted and piece dye business after July, and expect a busy season until December.

To a certain extent this has been a woolen season. Some of the most successful lines were those manufactured by worsted weavers out of worsted warps and woolen filling and having a dull finish; weavers with the most successful runs state that the secret of their success was brought about by this change of base.

Some of the new mills have been unable to secure orders, notwithstanding the shortage in production. Some buyers are congratulating themselves because they purchased no yarns at the extremely high prices which prevailed the latter part of last year, and they find that now, when they need yarn, the price has been lowered to a hard, commercial basis.

The yarn market is in a very firm and steady position with prices on a higher level than last year, yet the extreme prices which prevailed during the last part of the season are no longer obtainable.

Collections are slow with weavers, and it may in a way account for some of the backwardness in placing orders, as weavers do not force customers too hard in this respect for fear of losing business.

Cancellations are even now in evidence, but weavers expect a certain number of cancellations, and oversell their mills so

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that, when a cancellation is received, the cloth so canceled is shipped elsewhere.

Dress goods manufacturers are getting over their rush, and many are slowing up as certain lines have not sold. Where they were anxious to get yarn at almost any price, 71 cents is the best price they are giving for 2/36s, 3/8 blood quality, and they are not very anxious to secure the yarn at that price.

Business is fair, but the buying of yarn is over until next season.

Top manufacturers continue busy with an upward tendency to values as all have more orders than can be well handled.

The French yarn spinners continue busy with orders largely booked from weavers, although the knitters of hosiery, underwear and stockinette cloth are buying much yarn.

Hosiery manufacturers are making but little money as the yarn has advanced materially, while hosiery has not advanced.

The outlook is a good one although the immediate trade is quiet.

2/40s Australian	1.10
2/40s XX Delaine	1.02½
2/40s Half Blood	.92½
2/20s Half Blood	.80
2/36s ⅜ Blood	.72
2/26s ¼ Blood	.68

Woolen Yarn.

Spinners continue busy with more orders than can be handled until September or October.

The demand comes from all classes of the trade, and spinners are forced in some instances to refuse orders from old customers. The weavers are booking orders with spinners for thousands of pounds of yarn where previously hundreds of pounds had been ordered.

Spinners have all their cards engaged on long runs. The overcoating trade is particularly good at this time. Much yarn is being sold to worsted weavers for filling, and the knitters of elderdowns are taking on much yarn. In fact all classes of material for outside wear call for much woolen yarn.

French flannels are using large quan-

tities of fine white woolen spun yarn. The makers of elderdown for shoe manufacturing are buying yarn, but of a very cheap quality.

The hosiery and underwear trade are between seasons, and very little yarn is being purchased. To the underwear manufacturers the season has been a great disappointment; the first orders have been small and in consequence the trade is very slow.

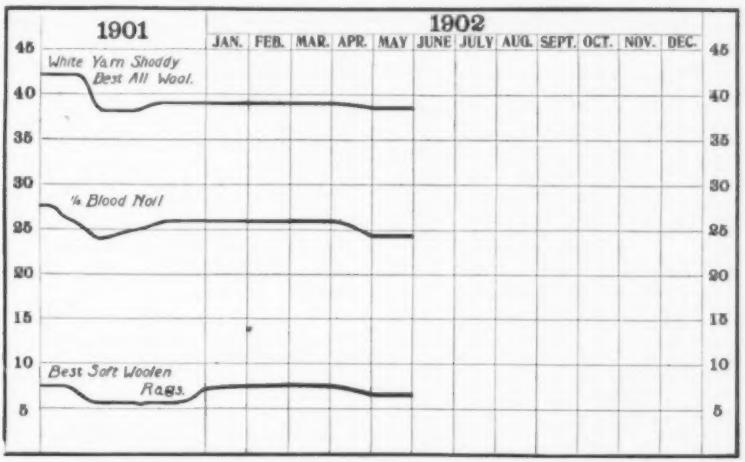
It is believed that the great trade is to be on duplicates, as we had a very cold winter and stocks were much depleted; buying is very cautious, and will be so until new orders arrive. Some of the knitters are getting discouraged and are going out of the business.

The trade has been mostly for medium wool garments. The craze for cotton fleeces seems to be over, and now the order is for as much wool as possible, regardless of quality.

The next season will certainly call for a better class of goods. The buying of the better material is always the last to be secured. It can be said with truth that the knit goods trade is buying but very little yarn or material of any kind.

The knit goods trade is certainly in a deplorable condition so far as all wool underwear is concerned; when it is stated that there is no business, the bare and undisguised truth is told.

The spinners of colored yarns for sweaters and gloves are busy and are selling much yarn. Prices all round are well maintained, with an advance in imported qualities. The London wool sales are up 7½ to 15 per cent. over last series. It is hoped that the duplicate orders will give knitters a chance for a good run.



Shoddy Market.

The market continues quiet and not much stock is moving. The labor troubles of the American Woolen Co. seem to be the excuse for this among some of the dealers, though, as a matter of fact, they are probably only in part responsible. Deliveries on some of the old orders are being held back and few new orders are materializing. Shoddy manufacturers are buying in consequence very few rags, and then only those grades which they can use immediately. The firmer feeling in the wool market will tend toward the strengthening of this trade. With this general dulness, shoddy men are still cheerful, for they have on hand orders enough to keep going for some months and considerable new business will undoubtedly have accumulated in small orders during that time. A change for the better may reasonably be expected long before the end of that period. In fact, the general outlook may be regarded as indicating a fair amount of trade before the end of this season.

NOILS AND WOOL WASTE.

The lower quotations made on noils last month remain unchanged. Scarcely any of this stock has changed hands during this period, and the market is unusually quiet. The mills are still turning out noil, thereby increasing the large stock already held, and there is likely to be little change in the situation during the next month.

The cotton waste market is quiet, but firm. The fluctuations in the price of raw cotton have caused the present quietness. Our quotations are practically unchanged.

RAG MARKET.

The rag market is very quiet, there being a demand for only a few stocks, principally merinos. The prices on these and black worsteds are firm and there is little chance of a falling off, owing to their scarcity.

New clips are also quiet, save in fine darks and choice lights, which have shown some movement during the month. The mills are carrying very small stocks and most of the business transacted is on the hand-to-mouth order. There is considerable expectation in the market today that the summer months will see some good trading in these lines.

SHODDIES AND EXTRACTS.

White yarn, best all wool	38-40
White knit, all wool, best, fine	28-32
White knit, No. 2	25-28
Light yarn, extra fine	25-28
New pure indigo blue	23-25
Fine worsted, new black	26
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20

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Cotton Waste Purchased on Yearly Contract from Mills.

Merino.
Fine light, all wool, No. 1 24-26
Medium light, all wool, No. 1 ....16½-17½
Medium light, all wool, No. 2 14-16
Fine black, all wool 20-22
Fine dark, all wool, best grade 17-18
Medium dark, all wool, No. 1 13-15
Medium dark, all wool, No. 2 12-13
Red knit stock, strictly all wool 19-20
Red flannel, all wool 19-20
Dark blue for hosiery, strictly all wool, No. 1 17-20
Dark blue for hosiery, not all wool, No. 2 12-14

DELAINE EXTRACTS.

Light 17-19
Medium light 15-17
Regular gray 12-13
Black 14-15
Fancy colors 16-20

WOOLEN RAGS.

Fine merchant tailors, all colors..... 8-9
Choice light colors 12-14
Browns 12-13
Blacks 9-10
Fine blues, plain 10-11
Fine dark 10-11
Medium dark 6½-7½

Worsteds.
Blue 15½-16½
Black 20

Serges.
New blue 15-16
New black 15-16

Flannels.
New scarlet 18½-22
New blue 17-18
Cloakings 3-4

SOFTS AND KNIT STOCK.

Soft woolens, best 6½-7
Old white flannels 17-18
White flannels, No. 2 11-12
Old red flannels 8½-9
Light blue flannels 6½-7½
Old blue flannels 6-7
Old plaids 5-7
White stockings 17-18
White hood stock 21-22
Clear hoods 7-8
Red stockings 7-8
Blue stockings 7-9
Fancy stockings, No. 1 7-9
Gray stockings 8-9
Black stockings 9-10
Knit stock comforters 7½-8½
Red knit 8½-9
Light gray knit 8-9
New light fancies 14-15
New fancies 11-12

Merinos.
Light, fine 14-15
Light, coarse 7-8
Fine dark 9-10½
Dark, No. 2 ..... 5-6½
Coarse dark 4½-5
Blue 10-11
Blue—seamed 14-15
Black—unseamed 10-11
New black 18-20
Small 2½-3½
Bunting 6-8

NOILS.

Australian 48-50
Fine domestic 40-44
½ Blood 35-37
⅜ Blood 27-30
¼ Blood 23-26
Braid 21-22
Carpet (white) 14-18
Carpet (colored) 10-12½

Seedy.
½ Blood 24-28
⅜ Blood 22-23
¼ Blood 17-19

FLOCKS.

Shear, fine white, all wool 9-11
Fine indigo blue, all wool 9-9½
Fine black, and blue, all wool 7-8
Fine dark, all wool.....5-6
Gig, fine, all wool 3-4
No. 1, black, all wool cut 6-7
All wool, fancy, shear and gig 2½-3½

COTTON WASTE.

No. 1 Spinners 8
No. 1 Machine 5-5½
No. 2 Machine 4½-5
Machine Cop 5½-6
No. 1 Cop 6
No. 1 Card 6½-7
No. 2 Card 4
No. 1 Oily Card 3-3½
No. 2, Oily Card 2-2½
Egyptian Card 7¼-7½
Peeler Combing 8¼-8½
Egyptian Combing 8¼-8½
No. 1 Linters 3½-4½
No. 2 Linters 2-2½
White Clips 4-5
Colored Clips 2-2½
No. 1 Picker 1⅝-2½

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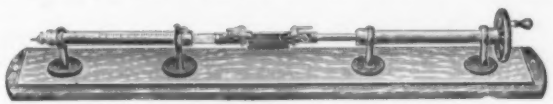

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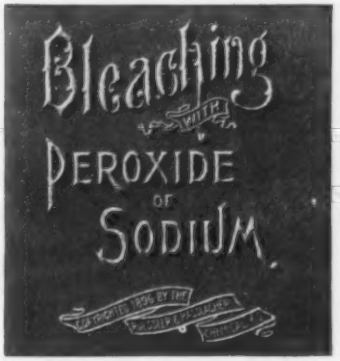

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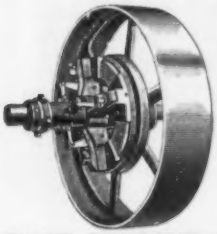

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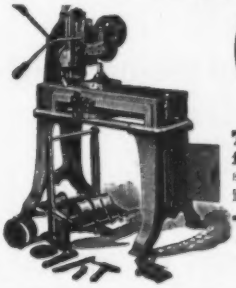

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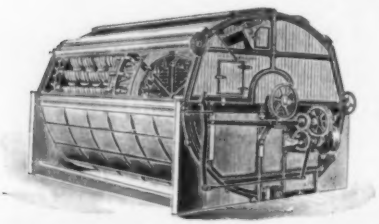

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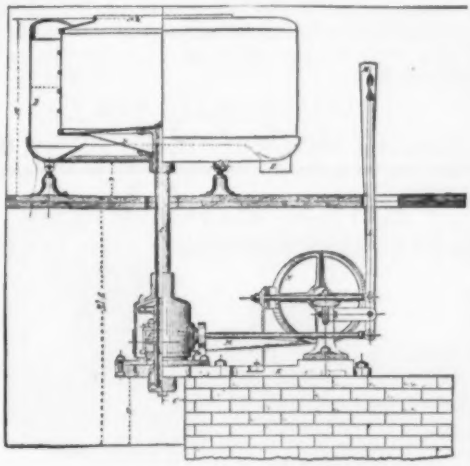

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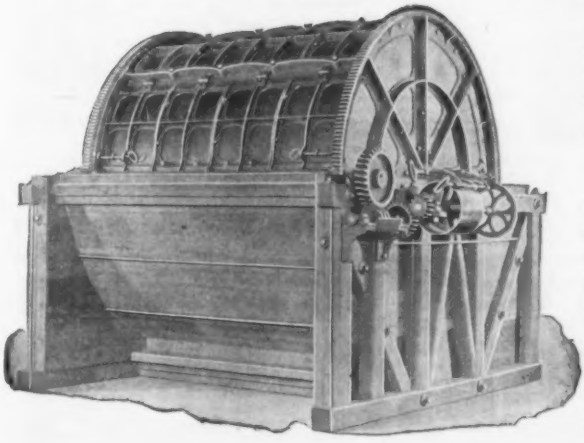

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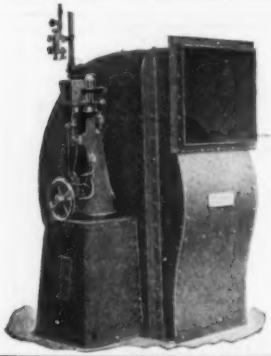

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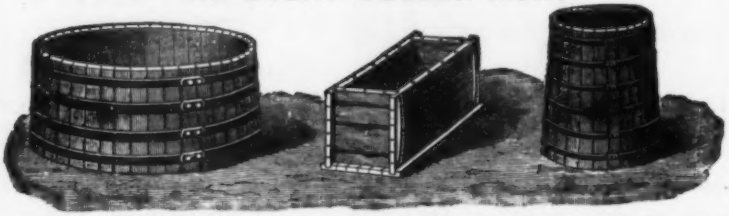

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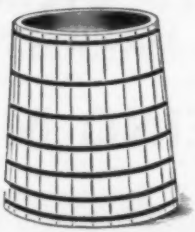

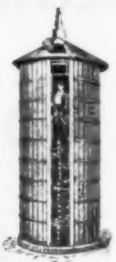

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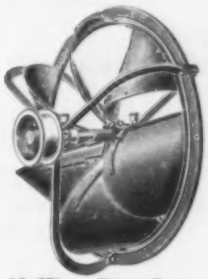

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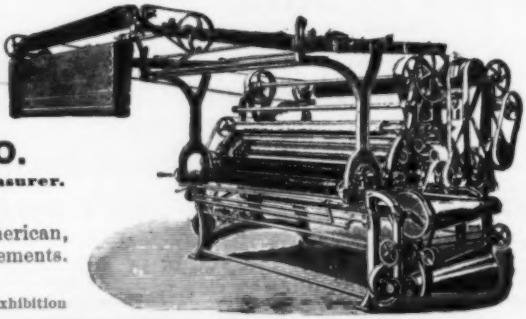

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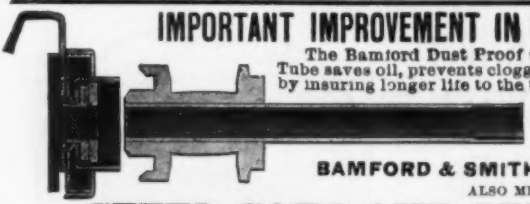

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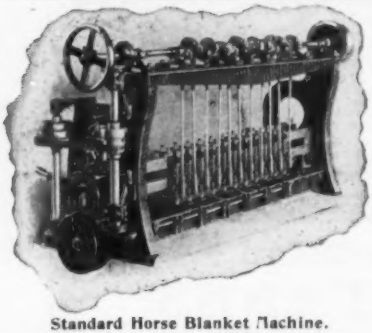

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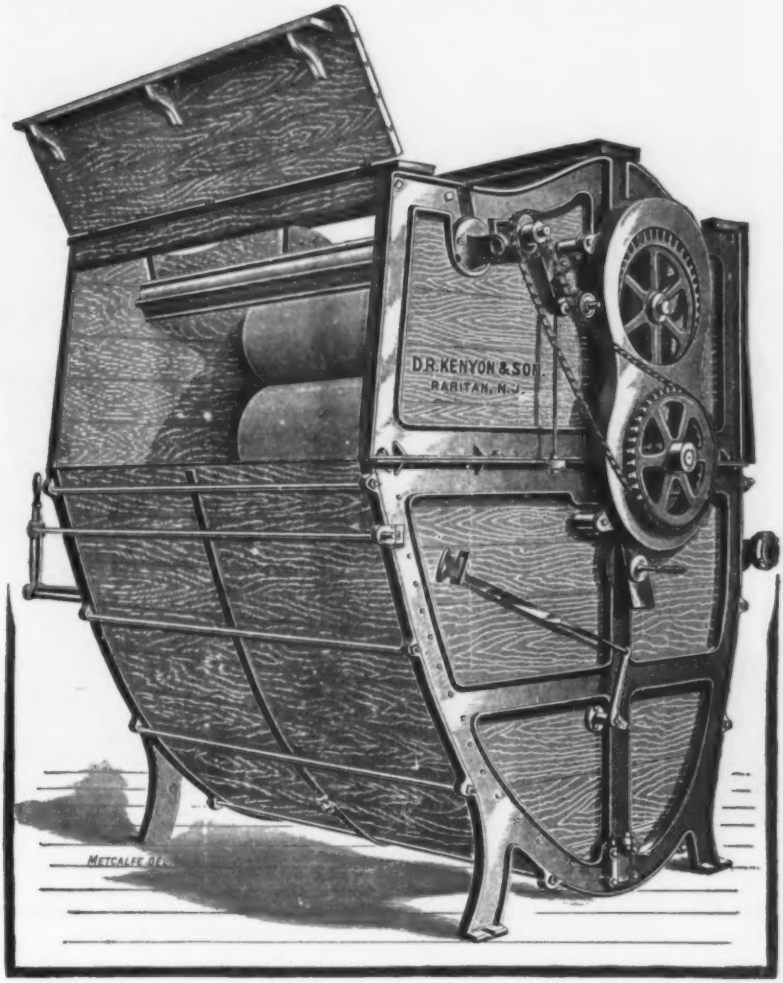

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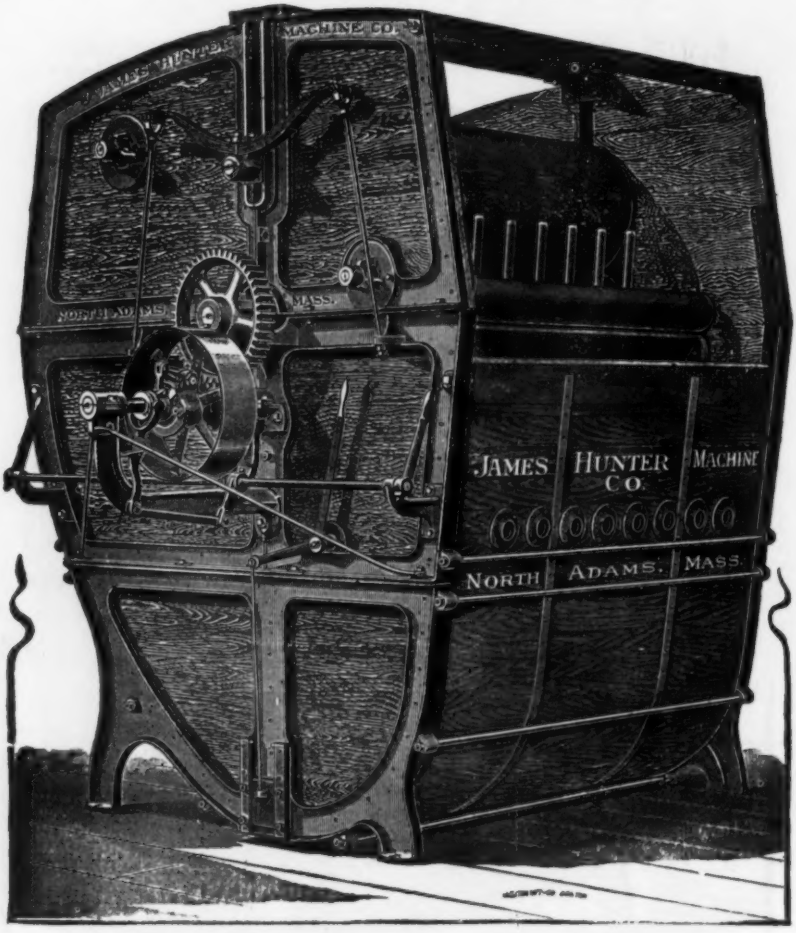

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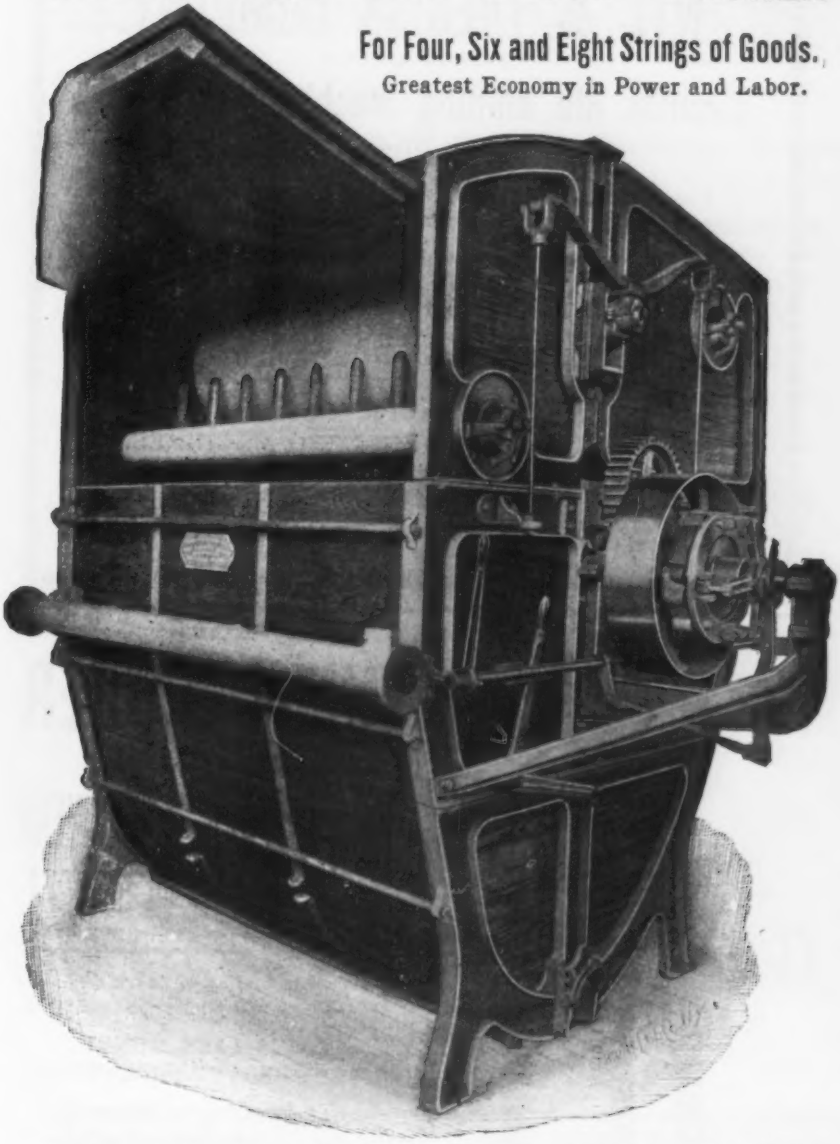

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All Kinds of Heavy and Light Goods are Desired.

Attachment for Washing and Fulling Knit Goods in the String.

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MANUFACTURERS OF

Circular Rib Knitting Machinery,

Underwear Machinery,

For Ladies' Vests, Combination Suits, Corset Covers, etc.
Men's Underwear, Sweaters, etc.

New Improved Sleeve Machines.

Machines for Rib Hosiery, Rib Tops and Cuffs.

LATEST IMPROVEMENTS ON ALL MACHINES.

MECHANICAL STOP MOTIONS
FOR CIRCULAR RIB KNITTING MACHINES.

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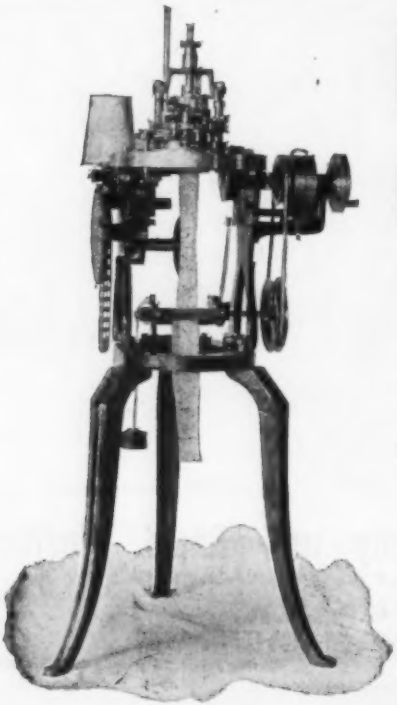

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For All Kinds of

HOSIERY AND UNDERWEAR

Entire New Design Ribber.
Protected by Patents
granted and others pending.

Excels in Quality of Fabric and Ease of Operation, Simplicity and Durability.

COSTS LESS MONEY.
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Absolute Guarantee With Each Machine.

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THE INCREASE IS DUE TO THE FACT
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Sold direct only by

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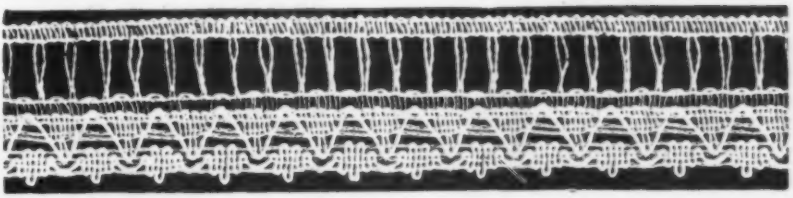

THE INVINCIBLE,
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For SEAMLESS Hosiery

A BIG PRODUCER.

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PRACTICAL AND ECONOMICAL IN OPERATION.

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NO EXPERIENCE REQUIRED TO TRANSFER RIBBED TOPS BY THE INVINCIBLE METHOD.

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A MACHINE OF THE HIGHEST GRADE.

Write for Catalogue.

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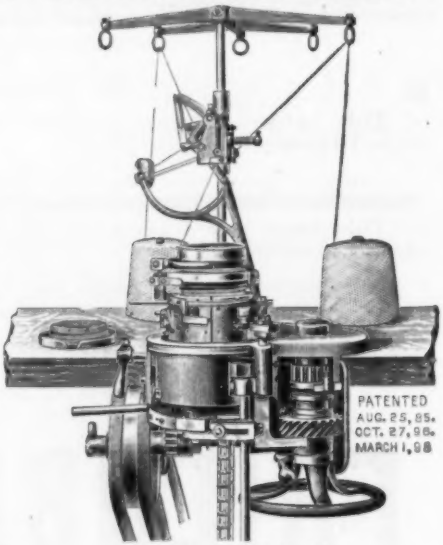
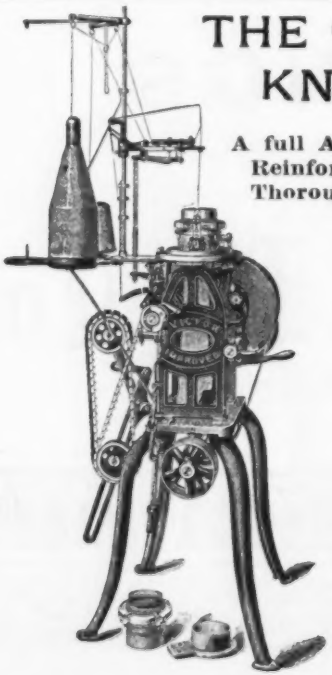


Factory and Main Office:
PAWTUCKET, R. I., U. S. A.
Branch Office, Room 370, Bourse Bldg., Phila., Pa



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A full Automatic Seamless Hosiery Machine. Reinforcing Thread Automatically Inserted. Thoroughly Interchangeable in all its parts. Automatic Two-color Striping Attachment, also, Black-Leg White-Foot Attachment.

A NEW LACE MACHINE
For Hosiery.

American Knitting Machine Co.

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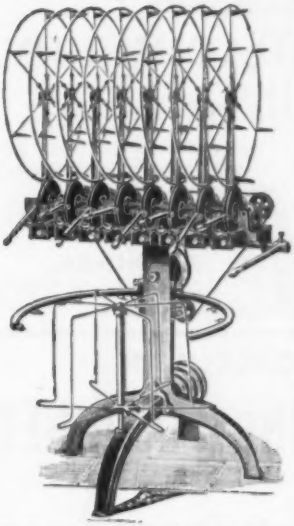
FACTORY AT WOONSOCKET, R. I.

JAMES TAYLOR,

Knitting Machinery for Hosiery and Underwear

New and Second Hand.



Back-winding Machine for winding the yarn from imperfect pieces back into skeins.

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UNEXCELLED MACHINERY FOR RIBBED UNDERWEAR,

Sweaters, Bathing Suits, Toques and Specialties, with or without Automatic Stripers and Designers.

These machines have the **only absolutely perfect Take-up Device** Depends neither on springs, friction, ratchet, nor state of weather for its efficiency.

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CIRCULAR RIB KNITTING MACHINES,

Carefully designed and well made with Solid Forged Steel Cylinders and Dials, Segmental Cam Rings, Encased Take-up, Stop Motions, etc. Standard Sizes, Reasonable Prices. Also

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Spring Needle Circular Knitting Machine

For Hosiery, Shirts, Drawers, Jersey Cloth and Stockinet.

A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brackets.

Celebrated Brand PYRAMID TRADE MARK **Lacings**

For Underwear, Overshirts and Sweaters,

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THE LAMB

LEADER OF KNITTERS

ORIGINAL and BEST

PARTS INTERCHANGABLE

EASILY and QUICKLY OBTAINED

Hosiery and Sweater
Cardigan Jacket
Automatic Racked Border
Full Fashioned Union Suit

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Successors to PEPPER MANUFACTURING CO.

MANUFACTURERS OF

KNITTING MACHINERY,

INCLUDING

Pepper's Flat Ribbed Cuff Machines,

Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

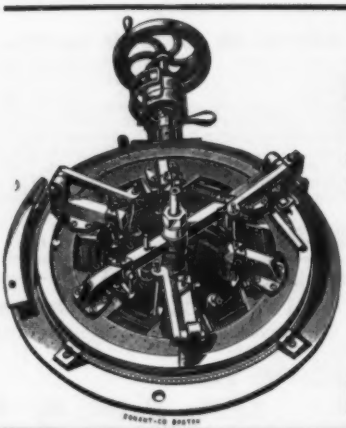
GOLF AND BICYCLE STOCKING MACHINES,

ALL KINDS OF

CIRCULAR RIBBED MACHINES,

For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins.

CORRESPONDENCE SOLICITED.



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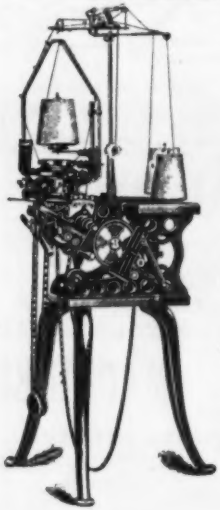
KNITTING MACHINES

Either plain or full automatic, with stop motion complete, for

RIBBED UNDERWEAR.
SWEATERS,
CARDIGANS,
CUFFS and ANKLETS.

The Leighton Circular Machines are the only ones which **Rack** or **Shog** the needles for fancy borders; also built for automatic striping; and with from 4 to 16 feeds for underwear.

Leighton Machine Co., Manchester, N. H



Excelsior Knitting Machine Manufacturing Co.,

BUILDERS OF

Knitting Machinery

Two-Feed 7-8 Automatic for Ladies String Work, also Black Legs with White Feet.

Regular 7-8 Automatic for all classes of Cotton Hose. Special 3-4 Automatic for Wool.

Excelsior Knitting Machine Mfg. Co.

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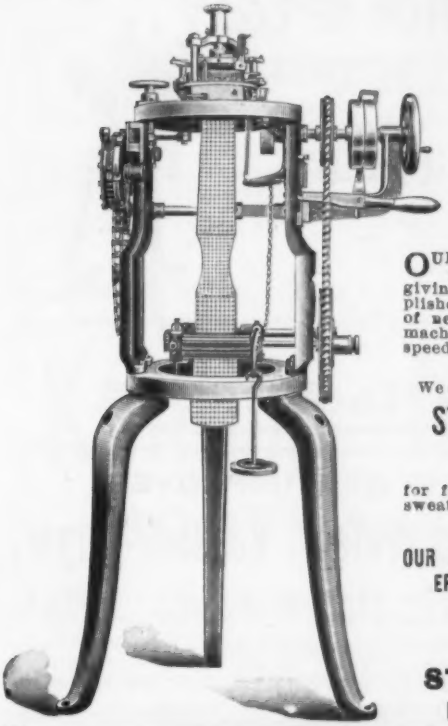

HIGH SPEED RIB KNITTING MACHINERY.

OUR latest model machinery has been designed to run at **very high speed** giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make special...

STRIPING AND DESIGNING MACHINES

for fancy golf stockings, bathing suits, sweaters, toques, toboggan caps, skirts, etc.

OUR MACHINERY ENABLES MANUFACTURERS TO "LEAD THE PROCESSION" INSTEAD OF STUMBLING ALONG WITH THE CROWD.

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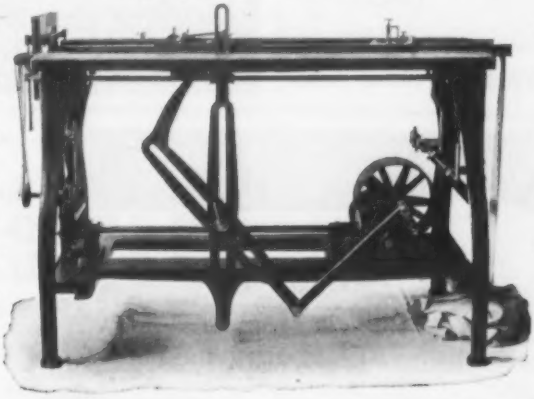
Adams Rib and Top Cutting Machine

FULLY AUTOMATIC.

Cuts all Fabrics with or without Welts. Perfect Clean Work. Requires no Trimming after passing through machine.

Solidity
Simplicity.
Absolute
Positive
Movements.
Best
Materials.



Cutting and
Working
Parts
Hardened
Steel.
Easy
Running.

Saving of Labor and Goods 1,500 Dozen Cuts per Day by one Operator. False Welts cut out automatically. Can be operated by a boy or girl. Accidents impossible. No Special Attachments. Patented in the U. S. A., Europe and America.

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213-215 Race Street,
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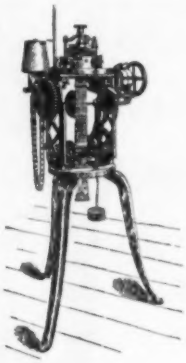
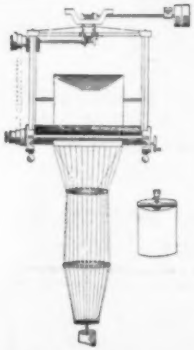
Full Automatic Seamless and Ribbed



Knitting Machinery.



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Johnson Patent Vertical Dryer,

Owned by the undersigned, when properly put up has no equal in this country. Doing more and better work with less labor, occupying less room than any dryer made. All the best equipped and up to date mills are putting them in. If interested write or call on

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BRUSHING MACHINERY
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EFFICIENT
DURABLE
LOW IN PRICE.

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SOLE MANUFACTURER OF THE

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The only Perfect Stamp for Hosiery, Underwear and all Woven Fabrics.

Blocks for Printing Hosiery.

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BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

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FOR ALL KINDS AND GAUGES OF SEAMLESS HOSIERY.

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Exclusive rights to Brown's ATTACHMENTS FOR LACE EFFECT.

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506 N. American St., PHILADELPHIA, PA., **Pioneer Builders of**

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FOR SEAMLESS HOSIERY.

Estimates for Plants Complete.

Write for information and catalogue.

KENNEDY'S CORRECT CUTTERS

THE VERY BEST

For Bands, Stays and Facings,
Suspender Straps, Gussets,
Drawer Bands,
Pockets, Shields, etc.

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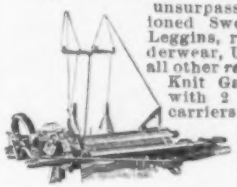
Our New Improved Light-Running Short Carriage

KNITTING MACHINE



unsurpassed for full-fashioned Sweaters, Jackets, Leggins, regular Knit Underwear, Union Suits, and all other *regular* and *selvage* Knit Garments. Made with 2 complete yarn-carriers and 2 color striping attachment and has the new combined Sweater Stitch Drop Lock and Tubular Lock. Special Glove Machines. Finger Knitting Machines 3 inches width of needle bed. Rapid 2-thread Lock stitch Overseamers.

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"OVERLOCK" MACHINE.

(TRADE MARK.) (Pat. Apr. 5, 1892.)
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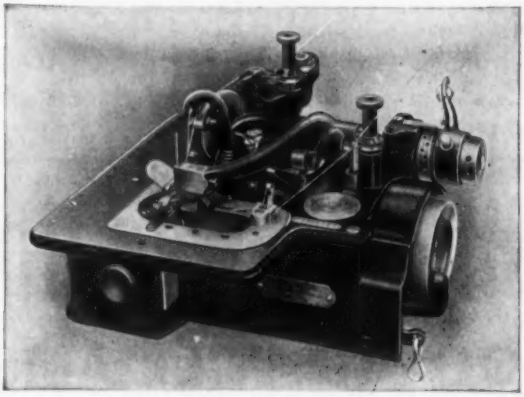
Business est. in 1859.

For TRIMMING, SEAMING, and OVEREDGING (or HEMMING) KNIT UNDERWEAR.

3,000 STITCHES PER MINUTE

12 to 20 STITCHES PER INCH



The "Overlock" Elastic Stitch is equal to the full stretch of the Goods

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THE ARNOLD SEWING MACHINE CO.

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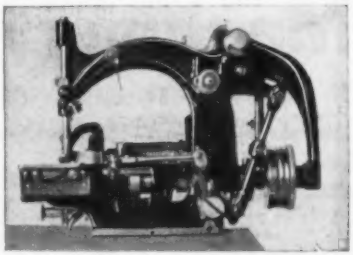

Overedge Welting Machine, with Trimmer.
The very best in the market.
(No royalty.)

Overedge Seaming Machine, with Trimmer.
3000 stitches per minute.
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Overedge Sewing Machine, without Trimmer.
For manufacturers of knit goods and other fabrics, with or without trimmers.

Our claims are SIMPLICITY,
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ACCESSIBILITY,

Every part of our machine being readily accessible.
This machine has 100 less parts than any other overedge machine.

THE CHEAPEST AND BEST METHOD

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FINISHING RIBBED KNIT GOODS

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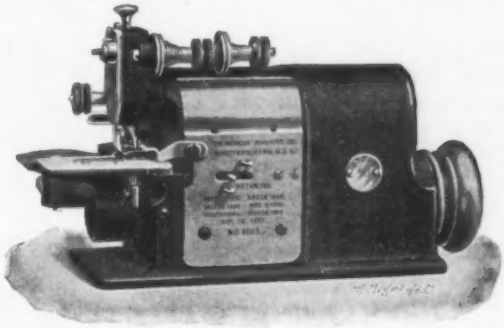
Blankets, Skirts or Cotton Goods,

requiring a useful and Ornamental Finish, should be finished by some of our various machines adapted for special purposes and finishes.



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346 Broadway, New York. **Hartford, Conn.** Bourse Building, Philadelphia.

Single "Interlock" Machine

(Trade Mark.)

FOR OVEREDGING, HEMMING AND SEAMING.

Especially Adapted to UNDERWEAR AND HOSIERY.

Class 12900.

Elastic Seam, Hem or Edge Finish.

High Speed.

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For Knit or Woolen Goods.

The most reliable machine of the kind on the market.

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Agent for the

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DOUBLE THREAD, ELASTIC STITCH, SEAM TRIMMING and CONCEALED WELTING

Machine,

FOR HOSIERY AND UNDERWEAR.

Trimmers put on all Makes of Machines.

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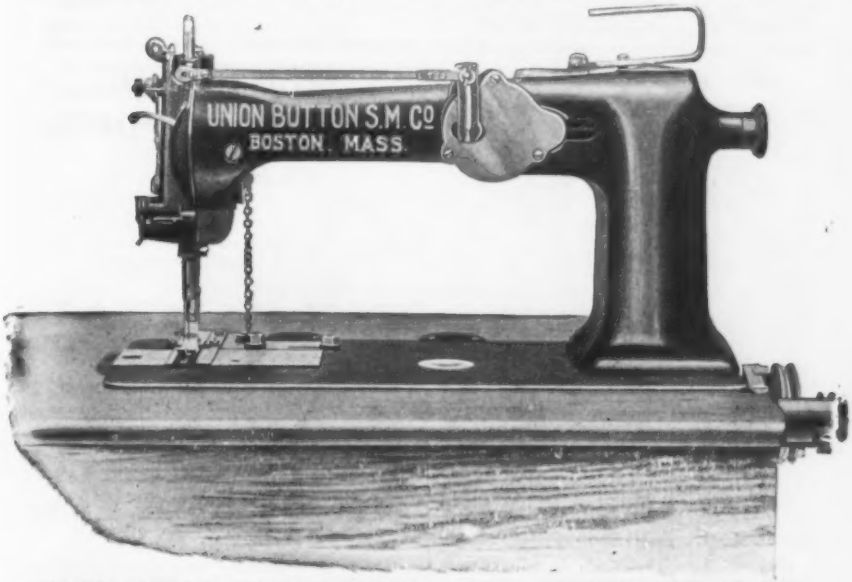
Our New Drawer Strapping Machine

SHOWN BELOW, will sew on straps of any width and thickness, makes either wide or narrow stitching across the straps and will also **BAR** each end of the stitching.



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THE MURPHY

High Speed, Elastic Stitch Sewing Machines for Finishing Knit Underwear and Hosiery.

High Speed, Double Thread Machine, with or without Trimmer, for Knit Underwear.

High Speed, Double Thread, Concealed Welting or Hemming Machine for Hosiery.

High Speed, Single Thread, Chain Stitch Machine with Hardened Parts.

Also High Speed Overedge Seaming and Welting Machines.

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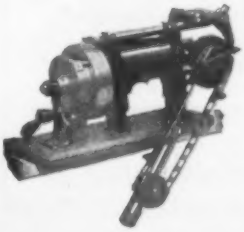

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AUTOMATIC FOLDING and CUTTING MACHINE.

Cheapest and best in the market.

J. C. GOODWIN, 2nd and Diamond Sts.,
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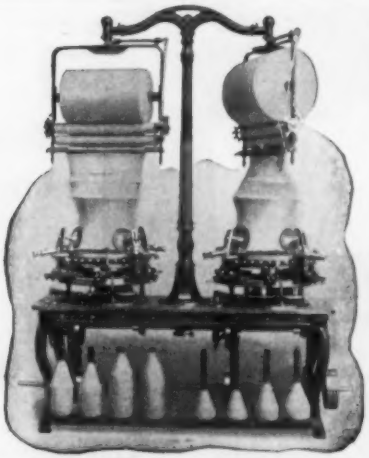
KNITTING MACHINE AND NEEDLE WORKS,

MANUFACTURER OF

Flat Rib Knitting Machines, 2 to 5 sections, Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Collarette Attachments, etc., etc. All the latest improvements. Sinkers and all Rib Machinery supplies. Patent Springs for Dyeing Boards. Also Ribbed Anklets made to order. Branch Shop, AMSTERDAM, N. Y.



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Knitters, Winders, Burrs, Attachments.

CIRCULAR AUTOMATIC RIB KNITTING MACHINERY FOR

Combination Suits,
Sweaters,
Richelieu Ribs,
Cuffs,
Ribbed Shirts,
Shaped Swiss Ribs,
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Over 1200 machines now in operation.

Also manufacturers of **COP WINDERS.**

The HOMER P. SNYDER MFG. CO.,
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Striping Attachments
FOR
Latch and Spring Needle
Knitting Machines.

These Stripers are being rapidly adopted by representative mills, among whom may be mentioned:

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BEATTIES' Patent Loopers.

Wm. Beattie & Son,
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An Illustrated Catalogue will be sent on application.

We make the best in

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HOSIERY BANDS AND LABELS

We carry all the "Specials."

Write for our book and samples.

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Manufacturers of
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The best hosiery needle in the market.
Manufactured by
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ORION TREAT,
MANUFACTURER OF
SCREW RIVETED BALMORAL AND DOUBLE RIB NEEDLES.
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All work guaranteed.

Wm. Breedon's Son,
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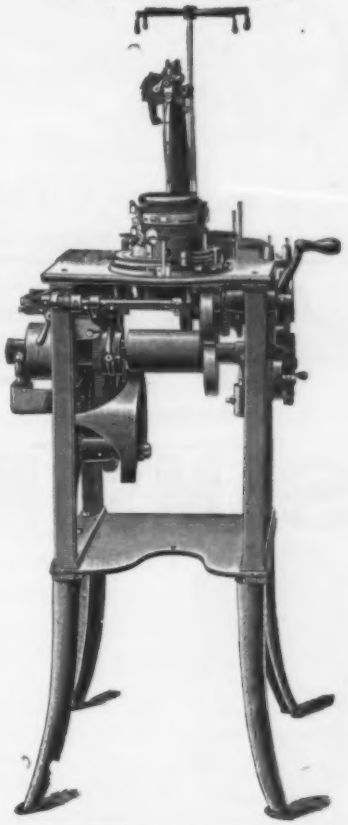

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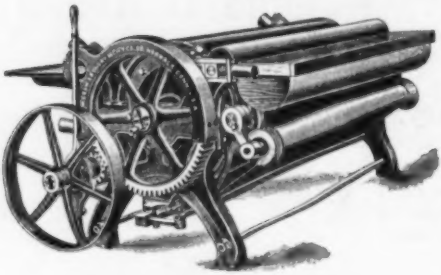

This machine irons and presses ribbed and flat underwear, giving a fine smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

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For Heads of **3** Feet and Upwards.

UPRIGHT AND HORIZONTAL.

ADAPTED TO ANY AND ALL SITUATIONS.

SPECIAL FEATURES:

High Speed, combined with **efficiency. Balanced Gate,** easily regulated by Governor. **Close regulation** and **steady motion.** Concentration of **great power in limited space,** requiring small penstock room. **Great strength,** and with a number of patented features. Special attention given to designing for difficult situations.

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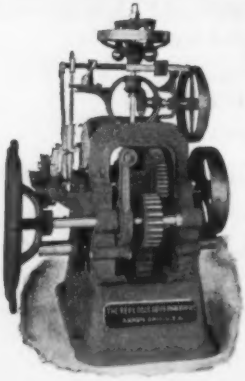

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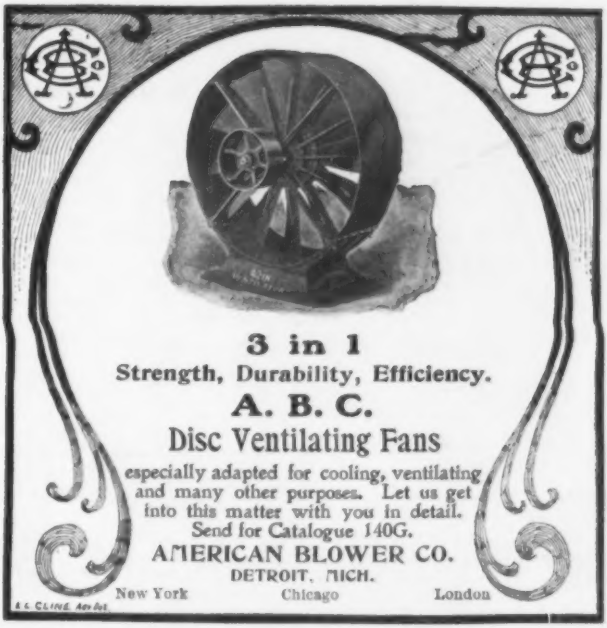
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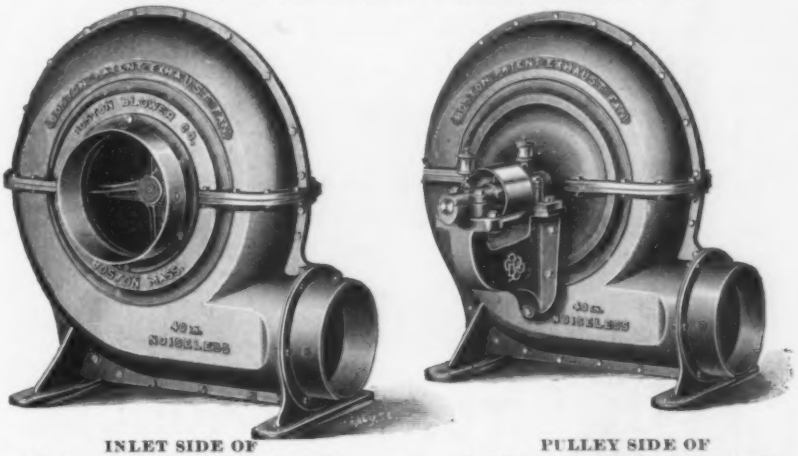

INLET SIDE OF RIGHT HAND WOOL EXHAUSTER.

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This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

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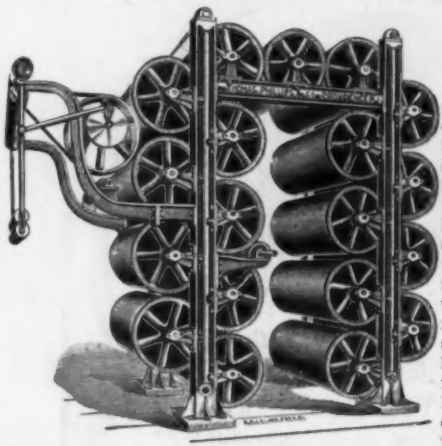
Drying and Finishing Machinery.



Phillips Upright Drying Machine.

The cut shows a 19-can machine with two tiers with intermediate can for continuous drying. We build any arrangement of stringing and furnish any desired number of cans, of any length, either with Phillips Steel Head or Cast Iron. We strongly advise our Steel Head Can. It is a big improvement as eight years' experience has demonstrated. This upright machine enables cloth to run without wide intermediate spaces between the tiers, as in horizontal machine, thus avoiding "scrimps." We also build Horizontal Frames, but on radically different principles from most others. Our illustrated catalogue explains all these points at length and has many plates showing different styles of stringing. It may be had for the asking.

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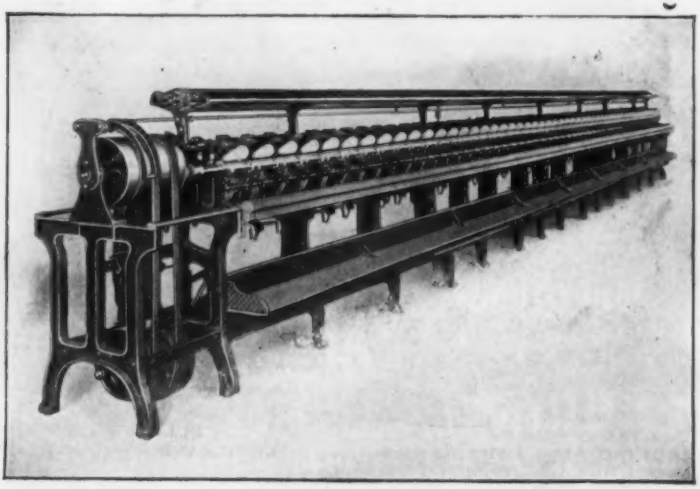

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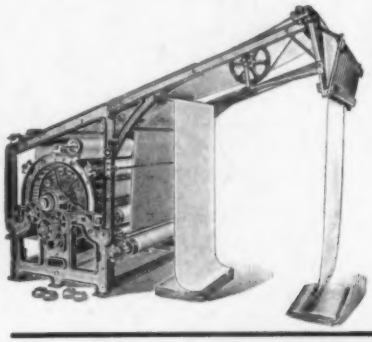

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